TRANSACTIONS

OF THE

American Dental Association

1869.

Serial
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in the City of New York
School of Dental and Oral Surgery

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TRANSACTIONS

OF THE

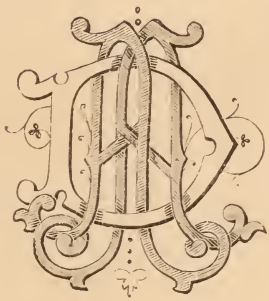
AMERICAN DENTAL ASSOCIATION,

AT ITS

NINTH ANNUAL MEETING,

HELD AT SARATOGA,

AUGUST 3 TO 6, INCLUSIVE, 1869.



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1870.

DISCLAIMER.

The American Dental Association, although formally accepting and publishing the reports of the various Standing Committees, and the essays read before the Association, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution.—*Constitution.*

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MINUTES

OF THE

TRANSACTIONS.

By EDGAR PARK, Secretary.

The American Dental Association commenced its Regular Annual Session at the Hall of the Union Hotel, Saratoga Springs, on Tuesday, the third day of August, 1869.

The Association was called to order by the President, Dr. J. Taft, at 11 o'clock, A. M., and the meeting opened with a prayer by the Rev. John Woodbridge, D. D.

An Address was delivered by Dr. J. G. Ambler, Chairman of the Committee of Arrangements, welcoming the Association to the place of meeting.

The roll of qualified members was now called, and the following named persons were present:

Old Members — Drs. W. H. Goddard, W. W. Allport, W. H. Shadoan, F. Peabody, W. H. Jones, E. A. Bogue, Jas. McManus, L. D. Shepard, J. Taft, W. C. Horne, A. L. Northrop, F. Abbott, J. G. Ambler, L. S. Straw, I. J. Wetherbee, Homer Judd, M. S. Dean, I. A. Salmon, J. B. Morrison, B. T. Whitney, E. L. Childs, G. A. Mills, J. H. Smith, Edgar Park, A. F. Davenport, H. F. Bishop, D. S. Dickerman, G. B. McDonald, J. G. Templeton, Geo. H. Cushing, S. M. Cummings, W. H. Atkinson, John Allen, H. L. Sage, P. Harris, J. N. Crouse, J. A. Bishop, J. H. McQuillen, C. R. Butler, J. A. McClelland, T. L. Buckingham, W. H. Allen, J. H. Githens, J. Fisk, Thos. Palmer, S. G. Martin, J. F. Adams, R. W

Varney, Flavius Searle, A. P. Southwick, S. D. French, O. C. White, H. J. Smith, A. Wert, C. Palmer, W. A. Bronson, P. Sloan, C. F. Wheeler, S. B. Noble, J. J. Vincent, E. D. Fuller, C. S. Stockton, J. C. Gifford, M. E. Elmendorf, S. B. Palmer.

The following absent members sent in their dues:

Drs. M. L. Chaim, F. Heindsmann, L. C. Wheeler, W. H. Eames, Geo. Watt, C. M. Wright, T. B. Hitchcock, J. S. Knapp.

New Members — Drs. W. C. Adams, J. J. Anderson, H. L. Ambler, E. F. Barnes, A. H. Brockway, Edmund Blake, Seneca B. Brown, C. D. Cook, W. G. Cummings, J. B. Coolidge, J. A. Cowles, Z. Cotton, A. Colton, J. R. Draper, E. Hale, Jr., A. M. Holmes, N. W. Hawes, D. C. Hawxhurst, O. A. Jarvis, W. H. Jackson, C. H. Keech, J. B. Morrison, H. G. Mirick, H. H. Martin, Chas. Merritt, I. C. Monroe, S. H. McCall, C. A. Marvin, E. S. Pearsall, C. W. Robinson, E. G. Roy, C. F. Rich, S. M. Sturgiss, G. R. Thomas, Jas. Truman, W. G. Tucker, M. S. Van Duzer, John H. Vedder, Geo. F. Waters, E. F. Whitman, Isaac Woolworth.

The Committee on Credentials reported the following persons as duly qualified delegates from their respective Dental Societies:

Boston Dental College — Dr. H. F. Bishop.
Boston Dental Institute — Drs. I. J. Wetherbee, J. B. Coolidge, W. P. Leavitt, E. F. Whitman.
Brooklyn Dental Association — Dr. M. E. Elmendorf.
Brooklyn Dental Society — Drs. C. D. Cook, G. A. Mills, H. G. Mirick, F. W. Dolbeare, I. C. Monroe.
Chicago Dental Society — Drs. Geo. H. Cushing, S. B. Noble.
Connecticut State Dental Association — Dr. J. H. Smith.
Connecticut Valley Dental Association — Drs. L. D. Shepard, E. F Barnes, J. J. Anderson, O. C. White.
Dental School of Harvard University — Dr. Geo. T. Moffatt.
Dental Society of Michigan — Drs. W. G. Cummings, G. R. Thomas, W. H. Jackson, D. C. Hawxhurst.
Dental Society of Northern Ohio — Drs. H. L. Ambler, F. S. Whitslar.

Dental Society of State of Indiana — Dr. I. Knapp.

Forest City Society of Dental Surgeons — Drs. C. R. Butler, Corydon Palmer.

Hartford Society of Dentists — Dr. James McManus.

Hudson River Association of Dental Surgeons — Dr. M. S. Van Duzer.

Hudson Valley Dental Association — Dr. J. R. Draper.

Illinois State Dental Society — Drs. S. M. Sturgiss, M. S. Dean, J. N. Crouse, H. J. Smith.

Massachusetts Dental Society — Drs. G. F. Waters, N. W. Hawes, Edmund Blake.

Missouri Dental College — Dr. Homer Judd.

Missouri Dental College Association — Drs. J. B. Morrison, E. Hale, Jr.

New Haven Dental Society — Dr. Isaac Woolworth.

New York State Dental Society — Drs. A. H. Brockway, O. A. Jarvis, Z. Cotton, Aaron Colton, J. H. Vedder.

New York—First District Dental Society — Drs. Chas. Merritt, E. G. Roy, C. H. Keech.

New York—Second District Dental Society — Drs. E L. Childs, L. S. Straw, T. C. Royce.

New York—Fourth District Dental Society — Drs. C. F. Rich, S. L. Stillman, E. S. Pearsall, C. A. Elmore.

New York—Fifth District Dental Society — Drs. J. A. Cowles, W. G. Tucker.

New York—Sixth District Dental Society — Drs. A. M. Holmes, S. H. McCall.

New York—Eighth District Dental Society — Dr. A. P. Southwick.

New Orleans Dental Association — Dr. C. W. Robinson.

Odontological Society of New York City — Drs. C. E. Francis, E. A. Bogue, C. A. Marvin.

Old Colony Dental Association — Dr. D. S. Dickerman.

Ontario Dental Society — Dr. W. C. Adams.

Pennsylvania Association of Dental Surgeons — Drs. Jas. Truman, C. N. Peirce, Jno. H. Githens. Amos Wert.

Pennsylvania College of Dental Surgery — Dr. T. L. Buckingham.

Philadelphia Dental College — Dr. J. H. McQuillen.

Southern Dental Association — Dr. W. H. Morgan.

State Dental Society of Pennsylvania — Drs. G. B. McDonald, H. H. Martin.

Wabash Valley Dental Association — Dr. Seneca B. Brown.

The reading of the Minutes was called for, but after being partially read, on motion of Dr. Judd, their further reading was dispensed with.

The report of the Publication Committee was called for, and at the request of the Chairman further time was granted.

The Chairman of the Committee on Prize Essays asked for further time, which was granted.

The Committee on Dental Physiology was called. No report.

The Committee on Dental Chemistry was called. No report.

The report on Dental Pathology and Surgery being called for, Dr. Atkinson, Chairman of that Committee, read its report.

On motion of Dr. Shepard, the order of business was suspended, in order to determine upon the hours of convening and adjourning.

On motion of Dr. Shepard—

Resolved, That our daily session be from 9 A. M. to 2 P M., and from 3½ to 6 P. M.

Adjourned to meet at half past three o'clock, P. M.

FIRST DAY—AFTERNOON SESSION.

Association met pursuant to adjournment. President Taft in the Chair. The Secretary being absent, M. S. Dean was appointed Secretary *pro tempore*.

On motion of Dr. Shepard, the meeting adjourned to Congress Hall.

At 3.45 P. M. the Association convened at Congress Hall, and President Taft called the meeting to order.

The minutes of the previous meeting were read and approved.

Discussion of the Report on Dental Pathology and Surgery was pronounced in order. No remarks being made, the Committee on Chemistry was re-called. No report.

Dental Pathology and Surgery was again called, and discussed by Drs. Atkinson, Wetherbee, Buckingham, C. R. Butler, C. N. Peirce, and E. A. Bogue.

Adjourned.

SECOND DAY—MORNING SESSION.

Association met in Congress Hall.

The Treasurer presented the following Report:

WM. H. GODDARD, Treasurer,

In Account with Am. Dental Association, 1868, *Dr.*

To Balance, last report	$ 99 99
" Cash, Annual Dues, 1865	6 00
" " " " 1866	15 00
" " " " 1867	66 00
" " " " 1868	860 00
" " Copy of Transactions, 1865 and 1866	1 00
	$1,047 99

Cr.

By paid Voucher, No. 1	$137 50
" " " " 2	488 54
" " " " 3	50 00
" " " " 4	20 00
" " " " 5	325 00
" " " " 6	10 99
By Balance	16 05
	$1,047 99

Assets.

To Balance, Cash ..... $ 16 05

Liabilities.

Balance due Publishing Committee, etc $220 75

WM. H. GODDARD,
Treasurer.

Referred to an Auditing Committee, consisting of M. S. Dean, E. A. Bogue, and L. D. Shepard.

Discussion on Pathology resumed. Participated in by Drs. Searle, Judd, McDonald, Peirce, Atkinson, McQuillen, Truman, and Buckingham.

By request, Prof. Buckingham made a verbal report upon Dental Chemistry.

On motion, the rules were suspended to allow Dr. Truman to present new matter, in consequence of his being obliged to leave before the order of business would be called, under which it could be regularly presented.

He objects to permanent membership, which compels the payment of arrearages, leaving a resolution concerning which, to be offered under the proper order of business.

Discussion of Dental Chemistry being announced in order by the President, it was participated in by Drs. Judd, Buckingham, McQuillen, and Atkinson.

On motion, the subject of Chemistry was closed.

On motion, the rules were suspended for the purpose of fixing the time of final adjournment. Friday evening, at 5 o'clock, was the time determined upon.

Adjourned to 3.30 P. M.

SECOND DAY—AFTERNOON SESSION.

Association convened at 3.30 P. M.

Minutes of the meeting yesterday afternoon and this morning read and approved.

Dr. C. R. Butler, Chairman of the Committee on Operative Dentistry, presented its report.

On motion, the order of business was suspended for the appointment of a Nominating Committee.

On motion, the Association proceeded to nominate; the following being elected:

W. W. Allport, C. E. Francis, M. S. Dean, T. L. Buckingham, Homer Judd, L. D. Shepard, A. H. Brockway, A. L. Northrop, and C. W. Robinson.

On motion of Dr. Shepard, the Committee was instructed to nominate, for the present, Standing Committees only.

Dr. Corydon Palmer made an additional report on Operative Dentistry, demonstrating his subject by well executed drawings of the teeth.

On motion, the rules were suspended for the exhibition of a case of extirpation of the lower jaw.

On motion, it was determined to hold subsequent meetings in the audience room of the Young Men's Christian Association.

Dr. Atkinson offered the following motion:

That a vote of thanks be tendered to Dr. Palmer for the models exhibited, and that the Treasurer be ordered to compensate him in the sum of one hundred dollars.

Dr. J. G. Ambler offered the following amendment, which was carried:

Resolved, That a committee of three be appointed, to consider the propriety of extending to Dr. Corydon Palmer a resolution of thanks, together with some substantial testimonial, as an acknowledgment for the very acceptable manner in which he has presented to this Association, by means of plaster models and drawings, an advanced method of preparing and filling teeth, and an appropriate classification of fissures where teeth are most liable to decay.

Drs. Ambler, Atkinson and McQuillen were appointed the Committee for the above named purpose.

The Auditing Committee made the following report:

Your Committee, appointed to examine and audit the accounts of Wm. H. Goddard, Treasurer, would respecfully report—

That they have examined his accounts, with the vouchers, and compared them with the orders indorsed by the Secretary and President, and have found them to be correct.

They have had, from the Treasurer, for examination, a long list of members who are in arrears for back dues.

They find that the Constitution was so amended at the Session at

Niagara, in 1864, as to require payments of dues from all permanent members, whether present or not at the annual meetings.

They are of the opinion that permanent members consist of all those who have once attended as delegates, and that such persons remain permanent members, until, their dues being paid in full, they voluntarily withdraw, or are dishonorably dropped from the rolls for non-payment of dues.

They are of opinion that it is not just, to those who have paid in full, to admit permanent members who are in arrears as delegates, until they have paid their past dues as permanent members, and thus stand square on the Treasurer's books.

They would recommend the adoption of the following resolution:

Resolved, That a dentist, having once appeared as delegate and become a permanent member, is not eligible to act again as a delegate until his dues are paid in full.

Respectfully submitted.

M. S. Dean,
E. A. Bogue,
L. D. Shepard,
Committee.

On motion of Dr. Horne, the report was received and the Committee discharged.

On motion, the first part of the report was adopted.

On calling for the ayes and nays on the latter part of the report, it was adopted by a vote of 30 to 27, as follows:

Ayes—Wm. H. Goddard, E. A. Bogue, James McManus, L. D. Shepard, J. Taft, W. C. Horne, Frank Abbott, J. G. Ambler, L. S. Straw, M. S. Dean, C. D. Cook, G. A. Mills, J. H. Smith, Edgar Park, G. B. McDonald, G. H. Cushing, H. L. Sage, F. S. Whistler, I. C. Monroe, A. H. Brockway, J. H. McQuillen, J. A. McClelland, W. H. Allen, W. A. Bronson, W. C. Adams, J. J. Anderson, D. C. Hawxhurst, F. Searle, O. C. White, S. B. Palmer—30.

Nays—W. W. Allport, W. H. Shadoan, B. T. Whitney, H. F. Bishop, W. H. Atkinson, G. R. Thomas, J. B. Coolidge, Geo. F. Waters, S. H. McCall, J. N. Crouse, J. H. Githens, A. Wert, J. Fisk, T. L. Buckingham, Thos. Palmer, E. G. Roy, Peter Sloan, C. A. Marvin, J. A. Cowles, S. B. Noble, Z. Cotton, E. D. Fuller, W. G. Tucker, M. E. Elmendorf, H. J. Smith, S. J. Cobb, C. P. Fitch —27.

On motion, to-morrow, at 4 P. M., was designated as the time for selecting the next place of meeting.

Dr. Abbott was appointed in place of Dr. Horne on Committee on Appliances.

Adjourned.

THIRD DAY—MORNING SESSION.

The Association convened at the rooms of Young Men's Christian Association, the President calling the meeting to order at 11 o'clock.

Minutes of the preceding session read, corrected and approved.

Dr. Judd, Chairman of the Publication Committee, made the following report:

The Committee upon Publication beg leave to report, that they have had published five hundred copies of the "Transactions" for 1868, at expense, for printing, postage and other expenses, of $477.78. Copies have been sent to all who have paid their dues, and whose names have been furnished the Committee, and the balance, about three hundred copies, is on hand, and subject to the order of the Association.

Respectfully submitted.

H. JUDD,
EDGAR PARK,
W. N. MORRISON,
Committee.

AMERICAN DENTAL ASSOCIATION,

To Committee on Publication, *Dr.*

To Printing Bill for "Transactions"	$440 50
" Wrapping 182 copies	3 50
" Wrappers, (paper)	75
" Wax	50
" Ball of Twine	50
" Transporting copies to Saratoga	1 50
" Postage	30 53
	$477 78
By cash of Treasurer	325 00
Balance due Committee	$152 78

On motion of Dr. Wetherbee, the report was accepted.

On motion of Dr. Horne, the Committee was discharged, and a vote of thanks tendered them.

On motion, an order was directed to be drawn upon the Treasurer, for the re-imbursement of the Publication Committee.

Dr. Allport, Chairman of the Nominating Committee, made a partial report, which, after subsequent alterations and additions, was adopted as follows:

STANDING COMMITTEES.

Committee of Arrangements — W. H. Morgan, S. J. Cobb, Nashville; W. H. Shadoan, Louisville.

Committee on Publication — M. S. Dean, Chicago; E. A. Bogue, New York; J. Taft, Cincinnati.

Committee on Prize Essays — G. T. Moffat, Boston; J. F. Adams, Worcester, Mass.; H. G. Mirick, Brooklyn; S. M. Cummings, Elkhart, Ind.

Committee on Dental Physiology — J. H. McQuillen, James Truman, Philadelphia; H. F. Bishop, Worcester, Mass.

Committee on Dental Chemistry — T. L. Buckingham, Philadelphia; John Allen, New York; G. R. Thomas, Detroit.

Committee on Dental Pathology and Surgery — W. H. Atkinson, New York; J. S. Knapp, New Orleans; C. R. Butler, Cleveland.

Committee on Operative Dentistry — J. Taft, Cincinnati; George H. Cushing, Chicago; Corydon Palmer, Warren, O.

Committee on Mechanical Dentistry — W. H. Eames, St. Louis; S. B. Palmer, Syracuse; Z. Cotton, Cambridge, N. Y.; S. M. Sturgiss, Quincy, Ill.

Committee on Dental Education — M. S. Dean, J. N. Crouse, Chicago; S. J. Cobb, Nashville.

Committee on Dental Literature — L. D. Shepard, Boston; J. McManus, Hartford; H. J. Smith, Quincy, Ill.

Committee on Voluntary Essays — I. J. Wetherbee, Boston; C. D. Cook, Brooklyn; L. S. Straw, Newburgh, N. Y.

Committee on Dental Histology — Homer Judd, St. Louis; W. W. Allport, Chicago; R. W. Varney, New York.

Committee on Dental Therapeutics — T. B. Hitchcock, G. F. Waters, Boston; C. N. Peirce, Philadelphia.

Committee on Dental Instruments and Appliances — Frank Abbott, New York; A. M. Holmes, Morrisville, N. Y.; J. B. Morrison, St. Louis.

On motion of Dr. Horne, the Committee on Nominations were further instructed to report nominees for the various offices in the Association.

On motion of Dr. Atkinson—

Resolved, That the new work of Dr. Jas. E. Garretson, entitled "Diseases and Surgery of the Mouth, Jaws and associate parts," be referred to the Committee on Dental Literature.

On motion of Dr. Hill, resolution laid on the table.

The report of Dr. Cushing, Chairman of the Committee on Prize Essays, was read by the Secretary.

Discussion upon Operative Dentistry announced in order by the President, and participated in by Drs. Atkinson, Wetherbee, Crouse, Thomas, and McDonald.

Adjourned.

THIRD DAY—AFTERNOON SESSION.

Convened at 3½ P. M. President in the chair.

Minutes read and approved.

Discussion upon Operative and Surgical Dentistry resumed by Dr. McDonald, and continued by Dr. Morgan.

The time having arrived for determining upon the next place of meeting, the Association, upon ballot, selected the city of Nashville, Tenn.

The Nominating Committee presented the following additional report:

FOR OFFICERS.

President — Homer Judd, St. Louis; W. W. Allport, Chicago.

First Vice President — S. J. Cobb, Nashville; J. S. Knapp, New Orleans.

Second Vice President — C. E. Francis, New York; W. H. Shadoan, Louisville.

Corresponding Secretary — I. A. Salmon, Boston; H. J. Smith, Quincy, Ill.

Recording Secretary — W. C. Horne, New York; M. S. Dean, Chicago.

Treasurer — W. H. Goddard, Louisville.

On motion, report accepted.

The regular order of business being resumed, Dr. C. Palmer further explained his method of filling, followed by Drs. Wetherbee, Adams, Crouse, Mills, McQuillen, Butler, and Palmer.

Dr. Whitney moved that when we adjourn, we adjourn to meet at 8 o'clock, and that the report of the Committee on Revision of the Constitution and By-Laws, be the special order of business.

Carried.

Adjourned.

THIRD DAY—EVENING SESSION.

Association called to order at 8 o'clock, P. M.

Minutes read and approved.

The report of the Committee on Revision of the Constitution being called for, Dr. Bogue, Chairman, presented it.

On motion of Dr. Straw, report accepted.

The motion of Dr. Ambler, to have the report read and acted upon section by section, was, together with the report, laid upon the table, on motion of Dr. Atkinson.

On motion of Dr. McQuillen, the regular order of business was resumed.

The motion that the regular order of business be suspended, for the purpose of election of officers, was carried, and the election proceeded with, with the following result:

President — Homer Judd, St. Louis.
First Vice President — S. J. Cobb, Nashville.
Second Vice President — C. E. Francis, New York.
Corresponding Secretary — I. A. Salmon, Boston.
Recording Secretary — M. S. Dean, Chicago.
Treasurer — W. H. Goddard, Louisville.

On motion, adjourned.

FOURTH DAY—MORNING SESSION.

Association convened at the hall of the Young Men's Christian Association.

Minutes read and approved.

On motion of Dr. Straw—

Resolved, That a Committee of five be appointed by the President, whose duty shall be to make the best pecuniary arrangement possible, for the passage by rail, from the principal cities to Nashville and back, of members and delegates who desire to attend the next annual meeting of this Association.

The Committee on Histology being called, Dr. McQuillen, Chairman, made a verbal report, upon which, remarks were made by Drs. Atkinson and Judd.

On motion, the next order was proceeded to.

The consideration of the subject of Mechanical Dentistry now being announced in order, Dr. Allen, Chairman of that Committee, made his report.

A motion was made and carried, that the regular order of business be suspended, to hear the report of the Committee on Voluntary Essays. Dr. M. S. Dean, Chairman, made his report. On motion, it was received.

A motion was made and carried, that we resume the subject of Mechanical Dentistry.

Dr. S. B. Palmer read a paper on Repairing Vulcanite. Remarks were made by Drs. Morgan, Adams, Dolbeare, and others.

A motion was made by Dr. McClelland, that a paper, in the hands of Committee on Voluntary Essays, entitled "The Coming Base," be read. Carried. The paper was said to come from Dr. C. M. Wright, of Louisville, and was read by Dr. McClelland.

Dr. McClelland then explained his manner of manipulating his Rose Pearl, and exhibited specimens of the work.

Dr. Palmer exhibited, with explanations, some appliances for moulding difficult cases.

The President made the following appointments for Committee on securing reduced railroad fares to our next place of meeting: Drs. E. A. Bogue, of N.Y.; T. L. Buckingham, of Philadelphia; Geo. H. Cushing, of Chicago; I. J. Wetherbee, of Boston; G. R. Thomas, of Detroit.

The following report was made by the Committee, to whom was referred a vote of thanks and substantial consideration to Dr. Palmer, for models exhibited.

The Committee to whom was referred the following resolution:—

Resolved, That the American Dental Association do hereby extend to Dr. Corydon Palmer a vote of thanks for the very acceptable manner in which he has presented, by means of plaster models and drawings, an advanced method of preparing and filling teeth, and an appropriate classification of fissures where teeth are most liable to decay,—

Would recommend that the resolution of thanks be handsomely engrossed, and sent to Dr. Palmer, by the Secretary.

J. G. Ambler,
W. H. Atkinson,
J. H. McQuillen,
Committee.

On motion, Dr. M. S. Dean, a member of the Committee on Dental Education, made a report.

A paper was read by Dr. Palmer, of Syracuse, on Dental Education for the People.

The subject was then discussed by Drs. Cobb and McDonald.

FOURTH DAY—AFTERNOON SESSION.

Association met at 3 o'clock, P. M.

Minutes read, corrected and approved.

The motion that every address be limited to five minutes was carried.

On motion, the subject of Mechanical Dentistry was passed, and the Committee on Dental Literature was called. No report made.

On motion, the Committee on Dental Therapeutics was called. Dr. Bogue, Chairman, read its report. On motion, the subject passed, and the report of the Committee on Dental Instruments and Appliances was read by Dr. H. L. Ambler. On motion, it was received and adopted.

The Committee of Arrangements presented its report, showing an indebtedness of $60.75. On motion, the report was accepted, and the bills ordered paid.*

The following, by Dr. Truman, having been left in the hands of the Secretary, was read by him:

WHEREAS, The recent action of two of the oldest Colleges of Dentistry in this country in admitting women to the full honors and duties of the profession, renders it imperative upon this National Delegated Body to take some action in reference to their admission into full fellowship in the profession, therefore be it—

Resolved, That in view of the successful results obtained in the education of women as dentists, we recommend to subordinate associations to admit to full membership any woman duly qualified.

Resolved, That in consultations, considerations of sex should be avoided; ability and moral character alone being the standard of judgment in all cases.

On motion, the resolution was laid on the table.

* The Publication Committee have divided this Report. That portion relating to Delegates may be found on page 10; the balance among Reports of Standing Committees.

Dr. Buckingham offered the following "Article" as an amendment to the Constitution, to be acted upon at the next annual meeting:

"No person shall be a member of this Association who holds a dental patent, or is, or becomes pecuniarily interested in such patent."

On motion, the report of the Committee on revision of the Constitution and By-laws was taken from the table.

The motion of Dr. Atkinson to consider the report was carried. On motion, the report was adopted.

Dr. Bogue offered the following resolution, which was laid on the table:

Resolved, That this Association does hereby express its regret at the existence of such misapprehension as has existed in regard to certain members, and its sense of the injustice, however unintentional, of an *ex post facto* interpretation of the laws which disqualify a delegate for membership in 1869 who was acknowledged to be a member in good standing in 1868.

Dr. Shadoan offered the following resolution, which was adopted:

WHEREAS, Several gentlemen were delegates to this Association in the first years of its organization, and have not since appeared either as delegates or permanent members, nor paid any dues since 1863, believing they were not members, unless they were sent as delegates, thereby not receiving any of the Transactions, and not knowing the changes and amendments made to the Constitution; therefore

Resolved, That the back dues charged to the following gentlemen upon the Treasurer's books be donated to them, and the Treasurer instructed to acquaint each with our action:

H. Benedict, W. Cahoon, Detroit; Thos. Burgh, Samuel Hassel, New York; W. K. Brenizer, Reading, Pa.; J. G. Barbour, Le Roy, N. Y.; L. Buffett, B. Strickland, Cleveland, O.; Chas. F. Campbell, W. C. Orcutt, E. M. Skinner, Syracuse, N. Y.; A. G. Coleman, Canandaigua, N. Y.; S. Dillingham, Wm. Georges, J. Gilliams, C. A. Kingsbury, Chas. Moore, Ambler Tees, J. W. Van Osten, Philadelphia, Pa; Geo. F. Foote, Cincinnati, O.; J. B. Gibbs, Washington; Pembroke S. Green,

Lambertsville, N. J.; T. P. Huntington, Painesville, O.; W. A. Jones, St. Louis; P. Knowlton, Portsmouth, O.; John McCalla, Lancaster, Pa.; L. Matson, Auburn, N. Y.; J. Naramore, Rochester, N. Y.; W. A. Pease, Dayton, O.; Lewis A. Rhodes, Norwich, Ct.; S. B. Smith, Terre Haute, Indiana.

All of the above owe $23 each, as shown upon the Treasurer's books, for dues from 1865 to 1869, inclusive.

The Committee on Ethics made the following report:

The Committee on the Code of Ethics would respectfully report:

That they have had brought before them charges against Dr. J. A. McClelland, of Louisville, of violation of Art. II, Sec. 3, of the Code of Ethics.

They have had evidence that the following advertisement is in large letters on the sides of the street cars plying through the streets of Louisville, Kentucky:

NATURE'S BEST IMITATION.

TEETH ON McCLELLAND'S ROSE PEARL.

No. 183 3d Street, between Green and Walnut.

2nd. That he has resorted to hand bills and posters, and published certificates, in violation of Section 3 of Article II.

They report the following resolution:

Resolved, That Dr. J. A. McClelland, of Louisville, be expelled from membership of this Association.

They find upon the records of the Society charges against Dr. C. P. Fitch, of New York, for violation of the Art. II, Sec. 3, but they do not feel authorized to recommend action in his case, as no definite charges or proofs have been brought before them.

W. H. Morgan,
E. A. Bogue,
L. D. Shepard,
Committee.

The portion of the report referring to Dr. Fitch was adopted.

On motion, the case of Dr. McClelland was referred to the Committee on Ethics for the ensuing year.

Drs. W. H. Morgan, C. R. Butler, and L. D. Shepard, were appointed Committee on Ethics for the ensuing year.

The Publication Committee was instructed to print the Constitution with the Transactions.

Dr. Homer Judd, the President elect, was now installed, and Dr. Taft, on retiring from the Chair, read an address.

On motion, the following resolution was adopted:

Resolved, That the thanks of this Association be extended to the retiring President, for the able and acceptable address to which we have just listened, and for the able, faithful and impartial manner in which he has presided over the Association during the past year.

On motion, the Association adjourned, to meet in Nashville the first Tuesday in August, 1870.

ADDRESSES.

ADDRESS OF WELCOME,

BY J. G. AMBLER,

Chairman of the Committee of Arrangements.

Mr. President and Gentlemen:

Some forty-two years ago, at about this season of the year, a lad some ten years of age had reached this vicinity, (Balston Springs,) after a journey of four days, from Chenango county, a distance of about one hundred and fifty miles by the then only means of travel, viz.: horses and wagon, in search of the all-healing virtues supposed to exist in those waters, which waters, or those of near kin, are now gushing up from the hidden laboratory beneath the earth's surface all around us.

Hither was this lad sent, as a last resort that parental solicitude could suggest, for his recovery from some dreadful malady or disease, which the most eminent and skillful physicians, in the locality where his parents resided, failed either to cure or satisfactorily name or account for. Some calling it a running sore from a swollen and inflamed cheek, the "King's Evil"; some, a scrofulous ulcer; some, with long visage and solemn expression, feared it might be a *cancer!*

How consoling to an anxious parent; dreadful indeed was the thought; and, at the suggestion of an over-wise knight of the saddle-bags, did his parents send him to the various medicinal springs of the country, these among the rest, but only to find his disease still enveloped in mystery and still unhealed; and they had well nigh given up all hopes of recovery, when from some, to them unknown cause, a tooth in the mouth of this youth, began aching terrifically, and the village doctor was summoned to extract this troublesome grinder, which he did with all the surroundings and ceremony peculiar to that day, which is all fresh to those who can look back to that time.

But suffice it for us to say, the tooth was extracted; but his parents did not look cause and effect as closely in the face, as dentists comprising this Association are accustomed to do, and consequently they forgot the operation, as the gum healed, and, much to their astonishment, their boy seemed to be "on the mend," a familiar expression at that time, and very soon recovered without any perceptible or known cause.

Well might they feel a grateful astonishment at this, when all remedies had proved failures, and the great expense incurred to no purpose, to find the sore healing, the swelling diminishing, and the boy fast recovering. What a splendid opportunity was here, for some magic ointment or salve, or touch of some seventh son of a seventh son! but it was not improved, the doctors had given up the patient and he had *recovered;* and now, after a lapse of nearly half a century, stands near the same spot where he first sought the healing waters; this time not for their healing virtues, but to show you *the scar*, and thereby disclose a tale of stupidity, and lack of penetration and thought, which to us, seems inexcusable.

Would that there had been a dental association, a dental convention, a dental society, or even a solitary dentist, here at that time, for then this poor youth would not so long have suffered. How stupid, how incredible, it is, that physicians could not discern a connection between the sore and the tooth; yet such was the fact. I mention this simply as a comparison between the past and the present.

Think you, a dentist of the present day, would fail to discover at first sight the true cause, and to apply the remedy? I think not. I firmly believe, gentlemen, that an ulcerated tooth was the only disease of this poor youth, and the remedy, though found at last, not by investigation or close scrutiny, but by *sheer accident.* The cure was effected without the knowledge of the agency, by the parents; and my father, to this day, will not admit the fact, although sorely puzzled to assign a cause for the speedy recovery. But they and I know that the disease was there. The tooth was taken out, and a scar remains as evidence. I presume you all can bear testimony to similar blunders by physicians, and of equally marvelous cures by dental operators.

But, gentlemen, I rose not to deliver an essay on the errors of the past, or to recount the blunders of physicians, or the wonderful results of dental science; I therefore leave these facts for reflection, comparison, and encouragement.

I repeat, some forty-two years have passed since I first visited this place for the healing virtues of these magic waters; and now, thankful to a kind Providence for having so long spared my life, and permitted me again to visit this charmed and charming spot, although for an entirely different purpose. I now would bear witness, not to the boasted efficacy of the waters or beauties of the place—but to the beneficial results of an association of kindred spirits, for mutual improvement, mutual advancement in dental science—an association destined to leave on the historic page a record of good or evil, as the efforts of its members may elect.

Forty-two years! Forty-two years is a long period in the history of our country and its institutions. *Through what scenes have we passed!* I will pass over the dark spots and incidents of the nation's life, and refer only to the bright side of the picture. How many millions have been added to our population; how many States have been incorporated with the Union; how many vast improvements have been made in science and the arts; and what rapid strides has our country made to power, wealth, and greatness!

Nor does the picture end here. We find our States and Territories reaching from the Atlantic to the Pacific. A mighty empire is springing up in distant regions, where, but a few generations ago, the wild Indians of the Sandwich Islands, and the cannibals of the Fejee, roved in unrestrained freedom, unknown to the civilized world; and on the spot where Captain Cook fell pierced by their javelins, we find American ships riding at anchor, and the American flag floating over the blue waters of the Pacific.

A thousand sail of ships and hundreds of thousands of citizens are at this moment in California, said to be the Ophir of Scripture, and gold and silver are flowing from that section of the Union in rich and rapid currents. Oregon, once the boundary of the north-west coast, in the neighborhood of the Arctic region, is one of the States. A railroad is completed from the Atlantic to the Pacific, and over its iron track one of our own number, a member of the Committee which I represent to-day, has just traveled, and has returned with his own scalp safe! How many from the heads of the red man he brings as trophies he has not informed us. A car now rests from its laborious transit of seven days from California, in New York City! The ocean and rivers are covered with our steamers; and wherever they go they carry with them the evidence of our enterprise, genius, industry, and wealth.

We compete with the world in the great variety, beauty and qual-

ity of our manufactures, and our skill and ingenuity are the themes of admiration and commendation in every direction. We are grappling with the venerable experience and mighty power of Mother England to arrive at the same perfection in the mechanic arts which she has achieved, and we have succeeded in accomplishing in a few years what she has required centuries to perform.

. Another bright spot in this picture of the past is the raising of the bright banner of dental excellence and success on European soil, by the hands of Dr. Brewster, which flag is still floating and its lustre kept undimmed by the example and efforts of the Evanses, the Gages, Horners, Bergs, Parmlys, Cranes, and others. One of these standard bearers I am most happy to announce as present with us to-day.

American dentistry has thus carried off the palm in all its contests, and has been acknowledged by awards to our tooth makers and mechanical operators, of the highest premiums ever given for artificial dentures. One was recently awarded to one of our own members, Dr. John Allen, of New York, *and he richly deserves it.*

How are we to account for the rapid progress of our country in arts, civilization, literature, commerce, and science? *By our free institutions;* by the equality of our laws; by the adaptation of our self-government to the wants and wishes of the community; by the progress of freedom; by the acknowledgment of the rights of man; and, above all, by *free education*, which visits all alike, from the cottage to the palace, and places our citizens on an equality in all that relates to genius and intellect! *Here* is the great secret of our success. We have no titled ranks, no hereditary power, no labor of the many to supply the wants of the few. Each man is for himself, and the energy of all combined constitutes the wealth and power, the genius, resources and permanency of the Republic.

Who would lightly part with this heritage of freedom? What American would be willing to exchange his rights as a citizen of the New World for all that the Old World can offer in exchange? *Our path is onward;* is rapidly progressive; and while we are true to our faith as a nation, and our integrity as a people; while industry, intelligence, temperance and virtue are our guides, nothing can impede our march to greatness and power. Nothing can prevent our becoming the first nation on the habitable globe.

A little reflection on our condition in life will show us the necessity of using every effort to strengthen and improve our minds. Man comes into the world much more helpless, and continues in that state

much longer, than any other animal. Without the care of parents he would perish. Without the aid of their experience and instruction he must be deplorably ignorant. He is so framed as to be compelled to follow *reason* as his guide; whereas, all other animals have a guide in their constitution and in their instincts. Let us philosophize on this for a few moments.

No animal but man wants clothing. Nature has provided in this respect for the brute creation; man must furnish this indispensable necessity for himself. No animal but man requires preparation for his food. *His* grain must be ground, his bread baked, and his meat cooked; and he must find salt, as an important preservative.

No climate yields spontaneously sufficient food for man. Yet every climate can supply the wants of other animals. Instinct only carries the brute creation to what may be required. Instinct carries men as far, and *vanity* carries them further.

The swallow builds her nest with mortar, and the crow with sticks. Man first erects a hut, then a palace. Man from his reason is enabled to do more than other animals; he can raise plants, and gather fruits and seeds. He can convert these fruits and seeds into bread and wine. He can manufacture silk, wool and flax; he can smelt minerals, and produce metals. He can do many things for his comfort and convenience by the use of his *reason;* and without cultivating his mind, reason will run wild.

Reason, therefore, is the highest gift which Providence has bestowed upon man. It is given to him instead of instinct, to lead him to the chief felicity which nature is capable of enjoying. The desire, therefore, of knowledge is a *divine impulse,* and we must assist each other to acquire it, by all the means in our power.

This association is a power in the *land,* and its influence is seen and felt throughout the world. Seed is here sown that will bear fruit defying competition in its kind.

The substantial benefits conferred by this and kindred associations upon individual members, is past all computation. This association, the eldest child of the American Dental Convention, has now reached its ninth birthday. It is *breeched and booted,* and claims the ability to fight its way to that bright *castle in the distance,* unassisted even by its venerable mother.

Young America, alike impatient under restraint, and anxious to break loose from all ties and associations linking it with the past, and with its eyes firmly fixed upon that motto, so conspicuous over the

entrance to the castle referred to — "Excelsior!" — determines to enter, and there, and only there, to lay down the arms of victory.

But I am forgetful of the fact that I am simply to welcome you on behalf of the Committee of Arrangements, the members of, and delegates to this association, the honored representatives of the Dental profession throughout the world; as well as to congratulate you all, that we are permitted by Divine Providence to assemble on this ninth anniversary of our association, and that too, under circumstances so favorable.

I assure you, Gentlemen, it is with no little *pleasure, pride* and *satisfaction* that I am the honored one to bid you welcome to Saratoga, to Union Hotel, to this magnificent Hall, so well adapted to the purposes and objects for which it has been secured, and so recently inaugurated by the gallant Seventh of New York.

In behalf of the owner of this splendid Hall, I do now bid you welcome, and repeat to you the expressed hope that it may meet the wishes and expectations of you all, with the assurance that they (Leland Brothers) will do all in their power to make it as acceptable as possible.

And on behalf of the Committee, permit me to welcome you to Saratoga, a place well calculated to excite the wonder and admiration of the world. And may we not with propriety call it *God's Laboratory*, for mingling nature's elements, and presenting them in various combinations.

All known gases seem to be, by process of sublimation, thrown off by the internal fires of the earth, and concentrated and absorbed by these waters. The why, the wherefore, is a subject not strictly in the line of our investigation; yet when we *reflect* upon the facts that nature seems to concentrate so many elements, and that, too, so *marvelously*, and produce such astonishing results, we can but wonder and reflect, gather facts, wonder and reflect again.

See nature's developments and perfection in her varied creations. Here are subjects for the Geologist, Mineralogist, Botanist, and the Chemist. And among the most noted of nature's wonders here, is the red man's "*Pool of Siloam*," created by the great Spirit Father, for the healing of the sick child of nature:

"Whose untutored mind
Sees God in clouds, and hears him in the wind."

Before the pale face invaders drove them from their enchanted grounds, they brought the sick ones, and here paid their devotions from an unsullied heart; drinking from this fountain, so wonderfully

created for them by the Great Spirit in this mysterious opening in the solid rock, from which, and from no known source, came this limpid, priceless fluid. Is it a matter of surprise that they yielded this gift from the *Great Spirit Father*, the great *medicine spring*, the *elixir of life*, with great reluctance?

This High Rock Spring, the greatest mineral curiosity on the *globe*, was the first mineral spring known to the whites in America. But as you are already, or will soon become familiar with it, I will now welcome you to this place, which was in the early struggles for a nation's life, the scene of many interesting events.

Not far from here was fought the battles of Lake George, Saratoga and Stillwater, where General Gates twice met the forces under Burgoyne. In the second contest Burgoyne was defeated and driven from his ground, and returned to Saratoga, but being surrounded and closely pressed, was compelled to surrender, with nearly 6,000 men, with all their baggage and ammunition.

Not far distant was the scene of an act of heroism on the part of the wife of General Schuyler, General Gates' predecessor in command of our forces, who set fire to the just ripening fields of grain, to prevent them from falling into the hands of Burgoyne.

Not far from this was enacted the most *brutal murder* of Jane McRea, whose history is as familliar as Ethan Allen's capture of Ticonderoga, by "authority of *the Great God and the Continental Congress.*" Her body was interred near the village of Fort Edward.

In short, Gentlemen Dentists, with your *wives and daughters*, *we bid you all welcome here*, welcome to all you can see, hear, find or obtain, *provided always, that you give an equivalent for what you get.* And I will faintly whisper in your ear, that you will be much smarter than I think you are, if you get anything without giving its full value.

Permit me now to extend a cordial welcome and greeting to our lady friends, whom we designate as wives and daughters, to the world-renowned Saratoga, with sincere thanks to those who have accepted our invitation, and honored and delighted us with their presence to day. Again I say, *Welcome, Welcome, Welcome!*

And now in *verse* my speech must flow,
To prove my *prose* sincere ;
For you must know, as I shall show,
That spirits now appear ;
And every Bard may have a score,
(Not such as tavern hosts
Make o'er and o'er behind the door,)
But good authentic Ghosts !

They come with an inspiring strain
To join our social glee,
And it is plain they are again
Just now inspiring me!
Old Chaucer tunes his ancient lay
To praise our Dental Art,
And bids me pay to you to-day,
The homage of his heart!

Immortal Shakspeare aids the theme,
And sends a tribute line,
Midsummer's Dream, a flash or gleam,
To grace our festal shrine.
The gentle Spencer, rare old Ben,
And Milton, bard sublime,
Each now and then commands our pen,
And guides the classic rhyme.

Let this the mystery explain,
Why we are poets, all,
'Tis not our brain, we 're not insane,
But Spirits fill this hall!
Our Brother B—— is Robert Burns,
There Byron sits in state;
Whoever turns, at once discerns
A poet in his mate!

PART II.

Now Saratoga is much famed, you know,
For drink, and other things, and nowise slow,—
Allow me just to hint, before we go,—
Sinking a fifty dollar bill or so.
Great Saratoga! Let the waters flow!

Here greatly congregate distempered cits;
Many afflicted with all sorts of fits—
Love, hypo, roguery, debts, duns and writs;
Many whose ways have led them into pits,
And very many who have lost their wits!

'Tis wonderful, what striking cures are made,
In frequent cases, past all other aid.
Coy maidens drink, and are no more afraid,
New life springs up, like mushrooms in the shade,
And Matrimony drives a thriving trade!

A batchelor here hoped to see the sun,
With two good peepers, though he had but one,
Since, when a child, he burst his father's gun.
Not many days the healing stream had run,
He met with two bright eyes—the thing was done !

A colonel came, (don't mention it, I beg,)
To try the waters for—a wooden leg !
This truly seemed a very doubtful egg ;
But, it is said, he cured his pedal peg
In the rich stocking of the widow Gregg !

Perhaps the most surprising thing to tell
Is, how the fascinating, reigning Belle
Was captivated by an ancient swell
Who simply asked—had she a heart to sell ?
When lo ! Old Age grew young at Beauty's well !

A wife was long deluded with the view,
She managed better than her spouse could do.
They sought the Springs, and, just "to put her thro',"
He let her pay the bills ! the 'stonished shrew
Went home recovered ! On my word, it's true !

One had a dreadful tendency to scold !
Her husband lavished awful sums of gold,
But still his death-knell was forever tolled !
Yet here she mended ! And the thunder rolled,
Into sweet peace, in that domestic fold !

Cupid and Hymen here conjointly reign,
Nor youth nor maiden seeks their aid in vain.
No spinster's, bachelor's, nor widow's pain,
But finds relief on this enchanted plain—
Each lad a sweetheart, and each lass a swain !

I knew a sisterhood—five charming girls—
Who long had bloomed among the city churls.
No sooner here they had unbound their curls,
Away with each a dashing lover whirls,
And all their tears became connubial pearls !

Five thousand happy nuptials every moon,
Each sipping nectar from a golden spoon !
Each day as rosy as the first of June,
How fly the nimble seasons ! Gone, how soon !
Yet, "Haste the wedding," still the favorite tune !

How many of our guests may feel the dart
Of that sly rogue, who aims at every heart?
Be not alarmed ; it is but Cupid's art ;
For sighs and vows a few will soothe the smart,
And *Hymen's ring* a speedy cure impart !

Grand remedy for poverty and care !
Why, grub and butterfly no more compare,
Than some you notice here, and *know* elsewhere.
Gracious, how liveries make the people stare !
So Muggins passes for a millionaire !

Attracting elements are here so strong,
All magnates are compelled to—"come along!"
One who had swallowed a whole railroad wrong,
Rushed like a comet lately through the throng,
And nothing stopped him but—the dinner-gong !

Here still are many hoping for relief,
Though all life's joys have faded into grief ;
And it is rumored that a police chief
Came hither lately—looking for a thief !
No cure for him ! His stay was very brief !

Part III.

Now all these stories, bad or good,
Come from the ghost of Thomas Hood,
Yet here 's a grand historic field,
Where rock and glen their records yield,
That should each thoughtful mind inspire
With awe and wonder, to admire
The mighty providential plan
That marks the ways of God to man !

Behold these mystic founts of health—
A boon alike for want or wealth !
Who these abounding streams could give,
And say to dying mortals—live !
Except the Good Physician, God ;
Before whose touch the mountains nod,
While valleys, answering to his call,
Send up their treasures—free for all !

No fabled draughts, restoring youth,
But living streams of health and truth !
Nor Greek, nor Roman, e'er could sing,
Nor Jove, nor Ceres, e'en, could bring

Such gifts as here the rills reveal,
While angels wait to bless and heal.
Divine Bethesda! Sacred wave—
Sweet as the Rock of Moses gave!

What memories from the days of old,
When Freedom's flag was here unrolled!
Here proud Burgoyne met noble Gates—
As tyrants meet the frowning fates—
And fell before our Banner's path
Like trees in fierce tornado's wrath—
Fell to the dust with broken wing,
And lost an Empire for his King!

Here gentle woman, too, may learn,
With patriotic fire to burn,
From that heroic wife, whose hands
Sent conflagration o'er the lands
That swept the fields of bending grain,
And left the foe a scorching plain!
Hail, Woman! Let her watchword be,
"For Equal Rights, and Liberty!"

Here sweet McRea, her breast of snow
Dyed by the savage Indian's blow,
Besought the fiend her life to spare;
But vain her tears, in vain her prayer!
Go, kneel beside her lonely tomb,
Where still the tearful violets bloom,
And drop the dew from Sorrow's eye—
That *so*, such Innocence should die!

And now we touch the final verse,
Which bids our humble Muse rehearse
That here our Delegates convene
For purpose worthy of the scene;
To bring the science of each part
To light the Temple of our Art,
That from this memorable place
Shall shine to bless the Human Race!

We own no limit, land or sea,
But toil for all humanity—
Save that we claim the rightful wreath
To represent the Nation's teeth,
And any, who our rights deny,
Will find we'll fight, but never fly!
Yet here our legend is unfurled—
Our mission is to bless the World!

Thrice welcome now each brother's hand !
Maine greets with joy the Flowery Land ;
The East here joins the mighty West,
And all, with one pulsating breast,
One noble purpose here proclaim,
To give our Cause enduring fame !
Strong in the good already done—
One Brotherhood ! forever one !

And now the bard concludes the lay
With the chief glory of the day—
These fair respondents to our call,
Whose presence radiates the hall.
O, lovely woman—half divine—
To your soft sway we all resign,
And all our grateful hearts decree
A cheer of welcome—three times three !

ADDRESS BY PROF. J. TAFT,

ON RETIRING FROM THE CHAIR.

MR. PRESIDENT AND GENTLEMEN:

Upon an occasion like this, my inclination prompts me to retire in silence, yet custom seems to require that a few words be uttered upon retiring from so honorable a position as I have occupied with you for the last year. I will therefore embrace this opportunity to present a few thoughts and make a few suggestions that do not often come within the range of ordinary discussions in our Association.

Let me first of all, however, congratulate you upon the state and condition of our profession to-day. A casual glance would convince any one, even the most obtuse, that our profession now occupies a position hitherto unattained. The results of properly directed effort and energy are apparent everywhere, and there is an expansion of these efforts to embrace new fields and instrumentalities; here I will not impugn your intelligence and apprehension by specification; and as a result of its outreaching efficiency, it commands more respect, attention and interest than ever before.

I see before me to-day this large body of men—intelligent, energetic, and industrious men—stimulated and fired with a holy zeal and purpose for the welfare and progress of our profession, necessarily involving much sacrifice. What may we not expect from a cause based upon the aims of such desires and purposes as I know exist here to-day!

Here is a new department of human occupation—merging into a profession—one based in the necessities of society, and involving responsibilities and duties of no small magnitude. It is to these then that I will, in brief, for a few moments, direct your attention, and perhaps confine myself to a small circle here.

I am ofttimes impressed with the thought that we do not adequately appreciate the character of the age in which we live and act. We are so familiar with the almost proverbial expression, that "enlarged

privileges and *advantages* increase responsibility," that we are liable to lose sight of its force and just meaning. The responsibility that rests upon us in any direction, and as fully and certainly in our profession as elsewhere, is measured by the ability that is given us; and it matters not how this ability is obtained, whether it be stamped upon the man at his creation in fullness, or comes by slow growth, matured by adventitious circumstances; in either case it comes from the same hand. We are too prone to ignore and forget personal responsibility; and too apt to overlook the fact that we have a "work that none other can do." We have responsibilities in common with our fellow-men—1*st, each one to himself;* 2*nd, to society;* 3*rd, to our profession;* 4*th, and, higher than all, to God.*

Every man stands in very near relationship with himself, and owes that to himself which no one else can pay—the which, if he neglects, it is undone forever.

What are the responsibilities and duties devolving upon each one in reference to himself? This is an important question. He who is faithless to himself will not be faithful to others. No one loves another better than himself, is the almost universal rule. The declaration, somewhere made, that "peradventure for a good man some would even dare to die," when verified *in fact*, is a rare exception that challenges the admiration of the world.

Every one should aim and endeavor to be what he was, by the Author of his being, designed to be. Each should cultivate his talents to the highest attainable point. There are various incentives to this. In every man there is a tribunal that holds him to a strict account for all his acts in life. His own *comfort* and *welfare* require that he be neither *barren* nor *unfruitful*. His duty to others also demands this self-cultivation. We are so inseparably linked together by many and strong ties, which we cannot break, that if we fail to attune them according to the original design, discord is the result.

In seeking a foundation upon which to rear the superstructure of a professional character and reputation, let no one rest satisfied with that which is evanescent and unstable. Make the foundation deep, broad, and firm; let it be fixed upon the rock of truth, and not upon the sand and mire of falsehood and error. No man can, with justice to himself, afford to base the foundation of that superstructure, which it is his life work to rear, upon the sand, while the everlasting rocks are beneath his feet, upon which, if he will, he may plant himself so that the gates of hell shall not prevail against him. This rock lies deep beneath the

accumulation of sand and rubbish—ignorance and error—the which to dig through requires persevering energy and industry. Every one must engage in this work for himself; none other can lay his foundation; it must be done by his own hands, and well done; a mistake in a superstructure may be easily remedied, and changes often made, and be very good and beautiful in the completion; not so with the foundation—if it is imperfect, nothing will be reliable from the base to the capstone.

We all require for our growth and nourishment the best food we can get. Then why rest satisfied with the *husks*, and too often with the effete offal? Let us seek and eat the pure bread of life that we may grow to the stature of perfect men.

We are under great obligations and responsibility to society—to our fellow men. With these we can do nothing rightfully except fulfill their indications. All are so bound together by the ties of a common humanity, and so dependent one upon another, that it is impossible to dispose of our mutual obligations otherwise than by a faithful fulfillment thereof.

We may consider for a few moments more, in detail, our responsibility to our profession—the duties that devolve upon us to that profession we love and have espoused, taken for better or worse. We have thrown our lives and fortunes, so far as this world is concerned, with it. Then how carefully should we look to its interests, how industriously labor for its promotion. I have no sympathy or patience with the professional brother who, reposing in his quiet selfishness, or reclining upon his dignity, refuses to take part in the great labor of the day. The man who does not feel and yield to the impulses of the age —aye, is not fired with its spirit—belongs to by-gone days; by some mishap his coming has been delayed a few generations.

Why must a few be made to bend beneath the burden that rests so heavily upon them, while so many occupy positions of listless ease?

Let us lay aside all antagonism except that against error and ignorance, but battle them with manly vigor and legitimate weapons. At this day, when so much is expected and required of us, we have not time, talent or strength to waste in fruitless contests—contests for precedence and self-aggrandizement. We have a common cause and a community of interests, and should make united and harmonious efforts to promote the good and advance the cause of our profession.

It would be pleasant and gratifying to retrospect the past—view the advances that have been made; but much time should not be

spent in this direction, while the heat and burden of the day is upon us. There is no time for retrospection in the midst of the battle, nor is it advisable for him who runs a race to look back before the goal is won.

And now my earnest desire and prayer is, and shall be, that our profession, which this Association so fully represents, may take its position as one of the battalions in the great army of progress, and keep abreast with the foremost in its grand march, with its tramp, tramp, tramp, to the music of the age, in the glorious consummation of the exemption of humanity from the dominion of disease and death

REPORTS OF STANDING COMMITTEES, AND ESSAYS.

REPORT OF THE COMMITTEE ON DENTAL PATHOLOGY AND SURGERY.

W. H. ATKINSON, Chairman.

To avoid profuseness on the one hand and ambiguity on the other, is no easy performance in a report on Pathology and Surgery. So rapidly does one discovery or interpaction demolish, modify or supplant another, that there seems to be little that is really permanent in our apprehensions of physiological activities and the aberrations therein, which are denominated pathological.

In fact, the whole field of organic activities is one immense arena of progress; and a repetition, or series of repetitions, of minor activities in but a very limited sense. Hence that which is capable of being learned and definitely settled so as to be strictly formulated, is meagre indeed, and always open to revisions and allowances for error that reduce its certainty to a minimum!

Whatever exerts an influence on nutrient action tends to physiological or pathological results in the living organism.

The seat of function is not generally agreed upon. But to the lowest anatomical element, the cell, is usually attributed the power of appropriation and rejection of substances brought to it. If, then, proto-plasma, sarcode, mucous mass, germinal matter—or by whatever name the juices of the flesh may be called—be the seat of function, it is evident that the term cell is a very ambiguous one.

In a sense, all contained within the dermal sheath of the entire body, is cell-content; and this sheath, or skin, the cell-wall proper.

The inception and slight degrees of pathological movements are only perceptible to the informed and specially erudite mind, while grave and continued disturbance is readily recognized by the commonest observers. Hence, the beginnings of serious troubles are uncognized, or permitted to declare themselves with the delusive hope that they may be overcome by the natural forces of resistance to the morbid presence, without special interference by the means of surgery; and hence neglected until well nigh irremediable, or, the next thing to it on the debit side, confided to the care of unthinking pretenders and quacks!

In any case of physical or moral distress, the novices and superficials are ever ready to decide the case and give advice with a celerity commensurate with their shallowness of conception and perception, while those capable of comprehending the situation, are inclined to move with caution, circumspection and precision. Hence the dash and nonchalance, of the ignoramus who assumes to "know all about it," is often compensated by the ready confidence of the suffering, until they are in a situation to demand the coolness and courage of real knowledge and skill, to avert the results of their rashness, or remain mutilated waymarks, as a warning to others to avoid such easy virtue and folly.

Cases in illustration might be multiplied just here, taken from practical experience, of the intermeddling ignorance of some in diagnosing cases, prognosticating results, and assuming to assess the amount of compensation in money consideration, for operations quite beyond their power to comprehend, much less ability to equally execute. These circumstances prove to be obstructions to advancement to the weak, but only incentives to higher endeavor and better achievement to him who is really in earnest!

Bearing in mind the constituents of wealth, (or physiological state) set forth in last year's report, namely, time, nature, mind, body, labor, riches, and the inter-dependent activities therein

ordained, we may be able to perceive the almost infinite number of possible points of inception of irregularities, by which the body may be despoiled of its inheritance of health, and made subject to one of debility or disease (pathology).

If, then, we are vulnerable to pathological influx from so many aspects of our being, is it any matter of surprise that so many stand in need of the kindly offices of a beneficent surgery, a correct practice of which involves either intimate knowledge of these complicated activities, or instant obedience to the spontaneous exigencies that unexpectedly arise in the field of our labor of life?

Man is said to have a duplex nature, named physical and mental. Such a statement partakes of the incompleteness of human attainment and apprehension; for we can have no manifestation of intellect, without a physical machinery to evolve it.

Action and resistance, or reaction, are the integers of every movement, physical or mental. Gravity itself is but an effort at the avoidance of perturbation and the attainment of rest to the bodies subject to its control. Nine-tenths of earnest assertion of knowledge of physiological and pathological processes are conclusions made from but a partial survey of the premises.

No single cause is sufficient to set up the dominion of disease in the organism. For where there is no affinity (or similarity of irritancy) within to attract and entertain the malign intruder from without, no advent of his discordant presence can break the harmony within the organic relations of force and form that constitute function. But so soon as debility has ripened into unrest, dissatisfaction and rebellion to the law of functional harmony of the whole body, it becomes an occasion that may subside, or by continuance betray the territory into the power of pathological dominion by entertaining it, unaware of its character and purpose, and disease be thus established by concurrent act of multiple force.

Any statement of absolute locality of nutrient activity, be it in cell, nucleus or nucleolus, intra-cellular or extra-cellular, must, in the nature of the necessities of the cells themselves, the tissues, organs, and the entire system, be made with allowances, limitations and accommodations, or be so vague as to be useless, or be *in toto* false in fact and in philosophy.

The tendency among learned men (so-called) has ever been to limit all our facts to the domain of the mere plane of sense. While every conclusion of the mind is an act supersensuous, and, therefore, not understood but by an exercise above that of sensation, viz., conception and perception, which can only be exercised by the individual mind for itself, so that each one will have a specificity of apprehension and understanding for himself, that cannot by possibility be exactly repeated by another.

This individual aspecting of the field of fact and philosophy, makes society necessary to a development and formulation of science, so that it may be pronounced in such terms as to confer the results of our labors on future generations; so that they, in turn, may push further and further into the illimitable field of cause and consequence, in normal and abnormal manifestation of functional activities.

This persistent effort to deny all certainty to every thing beyond physical sight and sense, ignores the origin of every primate of the human body, and all cause of function; forcing us to deal with bodies already so pronounced as to arrest enough of the light pencil to form their images or shadows on the retina, (itself but the refinement of these primary bodies evolved from an unseen substance far enough to catch the imprint,) that the something behind may perceive and interpret, by the very process ignored, the certitude of these veritable existences!

Knowledge (certainty) means perception, and perception means mind, and mind means matter and matter mind throughout the whole range of the homogeneous heterogeneity and the heterogeneous homogeneity which constitutes the magnificent panorama of living, breathing existences in the domain of the infinite projector and upholder of all, by the law of chromo-thermalicity by which one form dies that another may live in alternations of generations of the elements and primates of systems, circles and cycles.

The form, size and characters of cells, tissues, organs and systems depend upon two principal conditions, namely: plan and pabulum, or enabling circumstances by which type or plan

works out its behests in the formation, growth and maintenance of these in health or disease.

Tissues are recognized by the uniformity of the characters of their anatomical constituents. Plan ordains that enamel shall be completely calcified, and that dentine and cement shall retain uncalcified tracts in them, even to advanced age in the human subject.

Any derangement of this general plan will be evidence of pathological action to him who is conversant with the normal formations.

There is more ambiguity respecting the characters of the so-called connective tissue, than any of the anatomical elements of the body. The genetic connections and the functional attributes of the elements of connective tissue remain undetermined.

Fibrillary connective tissue and fibres, made up of collagenic substance without nuclei, are plainly recognized under the microscope.

In general, connective tissue is said to be composed of networks and trabeculæ formed by cells, bundles of connective tissue fibre, without cross connections or joinings, and the yellow, elastic, fibrous tissue.

Whether connective tissue be made up of embryonic cells, collagenic fibres, stellate cells whose projections anastomose with others to constitute nucleated fibres, wandering cells seeking congenial territory in which to locate, or "amœboid" cells; whether this tissue be made up of a portion or all of these, or whether these may not be the stages of perfection of simple white corpuscles becoming wrought into connective tissue, we await the proof. But that they all originate in the fountain of pabulum, there is no denial.

The solidal, humoral, neural and cellular pathologies, are but the aspects of that which properly constitutes the true study and expression of pathological movements.

As men advanced in apprehension of fact and philosophy, it was natural that most obvious phases should first occupy their attention.

The bodies of men and beasts were known to be subject to

growth and diminution in size and vigor, which suggested the idea of these changes taking place in the solids of their bodies. Hence the solidal pathology.

A closer inspection of the processes of nutrient activities brought to view the fact that moisture (wetness) was necessary to the development and activity of the various constituents of the body, and hence all nutrient change was said to take origin in the fluids; whence arose the humoral or fluidist pathology.

When the fluids became the object of special attention, they were found to pervade the entire organism, and to differ in degree of fluidity in themselves to such degree as to indicate the particular territories in which specific degrees of attenuation might be present.

In the alimentary tract, solids, semi-solids and fluids are indiscriminately found.

In the vascular tracts, fluids and soft-solids hold dominion; while in the neural tracts and mucoid sea of inter-cellular and inter-organic spaces, or canals and lagoons, we are only presented with homogeneous fluid without exception.

The similarity, not to say identity, in contents of the neural tracts and the mucoid seas, was not noticed at first, and the circulation of aura was said to be confined to the nerves, in which the inception of nutrient movements was supposed exclusively to take place. Hence the neural pathology.

At this stage of histological research, it was impossible to do more than review and compare the three partisan aspects of functional action, each phase of which could be maintained by apparently sound reasoning.

At length the microscope was discovered, and by its help elemental bodies were brought within the range of sight and measurement, to which the name of cells was given.

Upon the observations of these hitherto unseen, unknown, unsuspected bodies, the cellular pathology has been built.

Thus, step by step, the minor propositions in organology have been discovered, proven and admitted to dominate the functional field for a time, being successfully canceled into higher and higher propositions, until we now stand upon the

verge of the apocalypse of a grand pathology, whose equation includes all past phases as requisite to the magnificent summation in fullest revealment in the coming Pragmatic Pathology.

Pathological science is, like other departmental sciences, made up of the various stages of advance, from primal to ultimate expression of the aspects of the parts and the whole. These parts have their correspondences to the stages of development of human society, as follows: the solidal pathology corresponds to the savage state; the humoral, to the barbarous; the neural, to the civilized; the cellular, to the democratic and republican; and the pragmatic, to the commune, in which "all rights for all" shall hold the blissful dominion, and bring the reign of intelligent peace in which a true physiology alone is possible.

If we wish to account for, and thus attain, the pathological significance of the predominant instincts of the various stages of our development as a race and as individuals, all that is requisite to accomplish that desire, is to repeat the formula of the progress of the race just annotated, and apply it also to the five stages of life of the individual, from infancy to age, thus: in infancy we are savage in our prevailing instincts; in childhood, barbarous; in youth, civilized; in maturity, democratic and republican; and in the wisdom of age, advocates of the freedom and fullness of fraternity of the commune.

To trace the development of these instincts, from origin to culmination, involves a review of the progress of the formation of individual body, from simplest to most complicate, and from least to largest, as it arises in unpronounced chaos at the behest of affinity, and passes the various metamorphoses within the range of possibility, by the alternations of *de*structions and *con*structions, according to the plan or *in*tent within the *ex*tent of this same possibility.

It thus being apparent that something must die, that something else may live; we can only account for the first stage of human society, by building it upon the destruction of the Animal Kingdom or department of planetary existences; which embraces a like series of five stages, in whose successive destructions has been attained the constructive instinct of the Human Kingdom.

They may be annotated as follows:

1, Dermatozoa, (skin animals); 2, Glossozoa, (tongue or taste animals); 3, Rhinozoa, (nose or smell animals); 4, Ottozoa, (hearing animals); and 5, Opthalmozoa, (eye animals); each advance being the dominion for a time of a specialized function or power, in organs set apart and differentiated for the purpose in the order above named, adding, by involution and evolution, the five stages of complications and refinements of the animal kingdom, corresponding to, and prophetic of, the five human senses in the 1, Mollusks; 2, Fishes; 3, Reptiles; 4, Birds; and 5, Mammals; at whose highest expression man makes his appearance to hold dominion of the earth upon which we live.

Thus in our common enjoyment of the senses of feeling, tasting, smelling, hearing, and seeing, we have the ever present reminiscence of our origin in and dependence upon the stages of dominion of highest endowment of life expression, as displayed in the order above noticed; and thus is displayed the origin and significance of our animal instincts, which so essentially influence body and mind, through whose channels alone it is possible for food, poison, or medicine to act upon us.

Vegetable and mineral instincts yet remain to be examined, before the survey of the origin of instincts is complete, or we be able to deduce the possibilities of food, poison, or antidote to any body capable of being thus influenced.

Vegetable physiology is the catalytic act of (unseen) typal presence elevating mineral elements, and correlating them on the plane of vegetable existences.

Vegetable pathology is the catalysis of adverse or poisonous presence, resulting in parasites of low animal or vegetable forms, or reducing the elements of vegetables to the level of the mineral kingdom.

Presence, or catalysis, may tend to the permanence of combinations, or to separation of constituent elements of bodies in a state of loose tether.

Metamorphosis is the result (in some instances) of catalysis, or modifying presence, in causing the elements of one compound to fall apart, that they may be free to actuate their next affinity

most dear to them, and thus take on another form, as in starch under certain known relations of presence becoming sugar, alcohol and carbonic acid, acetic acid, and so on to the end of the chapter of destructive metamorphosis within the range of our powers of observation. Another equally important class of results of presence or catalysis is the exact opposite of this, and tends to hold organic compounds together for higher and still higher or varied combinations and complications, and thus tends to the perfection of bodies within the limits of typal character; instance, starch becoming sugar, dextrine, glucose, lignin, etc., etc.

Chemistry is the Physiology and the Pathology of the Mineral Kingdom.

The human system being constructed upon the basis of the destruction of the various types of existences from lowest to highest, must, if this be true, include every form of type of body from crystal to most indifferent nerve and mucus.

One further statement is necessary to account for a diseased progeny to result from a healthy parentage, and the reverse of this in healthy progeny resulting from diseased parents.

In the Mineral Kingdom, bodies grow by accretion of constituent portions formed from pabulum at the time of creation or separation from elemental mass, and have no nutrition but that of continuous togetherness or attraction of cohesion, so that when a constituent elemental body of a mineral is formed, there is no change, or rather exchange, of pabulum and formed material, and hence a simple fracture or chemical solution is the only pathology possible in this department.

In the Vegetable Kingdom, the process of formation and maintenance of the mineral kingdom is followed or repeated, with additional processes of development and sustenance, namely: shedding and enclosing the already formed parts. The cuticle and leaves are shed in accordance with the length of their life, determined by type, pabulum and circumstances; and the cambium hardens into woody fibre, and then becomes statical as a mineral, devoid of the ability of even communicating benign or malign influence to the succeeding layers of deposit of future growth. It simply acts as support to the trunk, while

layer after layer is added to the exterior of all exogenous trees. So that a vegetable is only an advanced mineral, partaking of the divided nature between this and the animal kingdom, repeating the former and anticipating the latter; thus preparing their substances to be amenable to the modes of aggregation and more complicated combinations that occur in and constitute the animal kingdom.

If the statements already made be comprehended, it will be apparent that the duration of the existence of a body is in an exact ratio of the simplicity of its nature; that is to say, the length of life or duration in individuality of form of crystalized carbon (diamond), or silex (oxide of silicon), is absolutely incomputable by any known limit of duration. How forcibly significant, then, does the oft-repeated "everlasting hills" (made up of crystals) become in the light of this statement, every one can judge. No less than that, of that other less pleasant scripture, "man's life is a vapor, a shadow that appeareth for a little while, and then passeth away!!"

Were there any proof needed to establish the truth of the statement, it will be apparent upon the investigation of the subject of death of the various bodies in existence. Take, for instance, the highest, as displayed in the human form. When a man dies, disruption takes place in the order of the reversal of the order of development of organic forms, but in the precise serial order of the appearance of the organs and tissues in embryology, and to the full development of the matured system. That is to say, he dies in the mucoid sea first, then in the terminal or finest neural connections of the nervous system, which continues into the vascular system, when we say the man is dead.

But the glandular, muscular, fibrous, osseous and dental tissues resist destructive influences in the order here named; the teeth being nearly indestructible by natural exposure; even the portions or distinct varieties of dental tissue displaying resistance to dissolution of their elements, in the order of simplicity of combination, namely: cement disappears first, dentine next, and enamel resisting to the last.

The processes of the constructions and destructions of bodies,

involved in the formation, growth and maintenance or nutrition of their parts, and these entirely, may be formulated as follows, beginning at the highest and finest, viz: Ether processes, Air processes, Water processes, Earth processes, and Fire processes. These are the sum of planetary activities, and must be regularly performed, to make and preserve a healthy status; while irregularity of processional movement, first inaugurates debility of some one, or some series of these,—fire, earth, water, air and ether processes,—establishing unhealthy status. The consentaneous alternations and agreements of these processes, constitute the measure of perfection of organization and nutrition of the bodies subject to these laws and processes.

The human kingdom, or as is said, the last link in the animal series, is a repetition of the preceding; and hence when in fullness of freedom of life—endowment, a microcosm; that is to say, the embodiment of all the functional possibilities in matter and mind. This "little world" has aspects and modes of life and being, which constitute and designate its personality, presence and power; each tissue partaking of the nature of the rest of the series of tissues, to constitute a bond of sameness and diversity, running throughout the whole, by which, mineralistic, vegetablistic, animalistic and humanistic aspects and characters, may hold the concurrent dominion of the system in harmonious accord, in elaborating the complex functions of body and mind. The inception of disease takes place in the territories that elaborate function, physical and mental, these being inseparable and interchangeable in the priority of the movement in making the change. That all mental action is not conscious motion, is proved by the completion during sleep, with or without dreaming, of the problems arising in the waking state, and but partially worked out when sleep arrested the conscious elaboration of the work. Perfection of type, or full satisfaction of tenant with tenement, (ghost with habitant), is the measure of a pure physiology, and where this obtains no disease can come.

Contradictory as these statements seem to be, they are, nevertheless, quite capable of reconcilement by the requisite observations.

If each constituent cell and tissue of the human body continued in its particular place, and elaborated the function of its locality as long as the body continued in existence, we should then have no disease of any sort, and men would be well until spent in every part, as a completely consumed candle exhales into the gaseous state! Alternations of generations in cells, is the prerequisite of growth and development; as examples we need only refer to embryonic cells and tissues, whose rôle of existence is wholly uterine, and to the tissues peculiar to youth, maturity and advanced life in man.

The metamorphosis of the tissues, that is, the common law of the economy, happily for mankind, does not hold in the teeth, and hence operations when properly performed upon them are permanent in character, and the best possible insurance against the deterioration of the pabulum, upon which the more evanescent tissues feed, and thus become the means of health and immunity from disease, to a degree difficult to overrate or overstate.

Then if every avenue to the human body and mind may be the source of pathological action, and we are reduced to the "vis medicatrix naturæ" and surgical means of restorations, how sedulously should we attend to the maintenance of normal states on the one hand, to perpetuate conditions of health, and earnestly study the processes of nutrient activities, that we may be able to remove obstructions, and supply the enabling circumstances under which lost functions and lost parts may be restored or supplemented, on the other.

These being the facts and principles by which alone we become able to actuate our professional functions, it is of the first importance that we understand the situation, and comprehend the limit of power for good (and evil) of the means at our command. Sick subjects alone are in need of, or amenable to, medication. Dead bodies and parts of bodies are beyond any means of restoration, except extirpation and substitution. With the dead human body we can do nothing further than to use it in the study of the laws of pathological metamorphosis, but many portions of the system can be separated after their death, without destruction of the somatic functions of life.

This last exercise is the legitimate function of surgery, especially that of oral surgery.

Were I required to project a plan of redemption of the human race, from the dominion of pathology, in all its demoniac control, I would most unhesitatingly, and with the fullest confidence in the success of the plan, prescribe the exercise of legitimate dentistry, as alone capable of bringing to pass the happy consummation! All that remains, then, to cut short this report, is to define and project the plan of this legitimate dentistry.

Legitimate dentistry consists in the preservation of the natural teeth in healthy state, to the end of life. And general as is the asservation of the utter impossibility of this, among those who have assumed to be "good as the best in the profession," I make no hesitancy in most positively asserting its easy accomplishment, in the hands of an earnest, honest, competent practitioner, if he but have complete control of his charge. How to do it, involves but two general propositions, namely: Keep the teeth clean, and thus secure their integrity, and where integrity is not attained, or is lost by fracture or decay, remove all imperfect parts, and restore the form and size of the tooth. That's all ! ! !

REPORT

OF THE

COMMITTEE ON OPERATIVE DENTISTRY.

C. RICHARD BUTLER, CHAIRMAN.

MR. PRESIDENT:

Operative Dentistry comprises all the varied operations upon the teeth—cleansing, extracting, pivoting, and filling. It may be expected that each annual report should contain something new, and as there has been no report for a year or two in this department, it would be fair to presume that there had been some advancement made in the modes and means of performing the duties in operative dentistry. But in a report like this, it is not my intention to dwell in detail upon any particular feature of the subject.

I am hardly orthodox enough to confine myself to the *filling* of the teeth, and think or say that that alone comprises operative dentistry. And I find by looking over the reports of the transactions of societies in various localities, that broader and clearer views are expressed, showing a steady step forward in this department of our science.

It is of the utmost importance to make a thorough examination of cases, and carefully cleanse the teeth by removing all accumulations of tartar, as a preliminary step before commencing to fill any. At the same time, give the patients the necessary instructions, how *they* may keep their teeth comparatively free from the deleterious effects of these foreign substances. And if there be any offending roots or teeth that cannot be made wholesome, let *them* be removed: in fact, get the mouth into a comfortable condition for the patients and tolerable for the operator, so that he and they may reasonably

expect good results to follow, when all needful operations are completed on the remaining teeth. An operator that neglects to do this, will fail in the majority of cases in getting satisfactory results.

It is necessary to exercise a good degree of firmness in these things, for there is a great disposition on the part of patients to dictate in such cases, and operators are liable to be over-persuaded to go on and fill a tooth here and there, *hoping* no trouble will occur to accuse them of their laxity of duty.

I have not yet seen any signs that give me hope that I may ever be relieved of the unpleasant operation of extracting teeth and roots for the best good of my patients.

The operation of pivoting is not near so frequently demanded as formerly. This item alone shows a great advancement in the operative ability of the members now composing our profession, and the people appreciating this fact, have their teeth plugged instead of allowing them to decay to the extent that makes artificial crowns necessary. When, however, this operation becomes necessary, it is one that requires more than an ordinary amount of skill. Whether the crown be secured with a wood or metallic pivot, the receiving root should be cut down to the desired shape, the canal drilled out and thoroughly filled, enlarging the orifice and beveling it outward, so as to cover the would-be exposed portion of the root with gold, so that the base of the crown would come on to metal instead of tooth bone. This filling may be made around a tube to receive the pivot or a piece of smooth wire which can be withdrawn after the gold has been consolidated, and when completed makes the most durable and cleanly operation that I have any knowledge of. The use of a screw in attaching a crown has recently been suggested; of its practicability I am unable to give any experience.

In filling, there has been wonderful advancement made, especially within the past six or seven years. The inventive genius combined in the profession has brought forth many ingenious and convenient appliances, that enable the earnest operator to more fully meet the ever increasing demand upon our science and skill.

The very neat appliances for securing and keeping cavities from the inroads of moisture during the unavoidable and tedious operations that we are now called upon to make, are found in the wedge, Hawes' (improved) ratchet clamp, Bradley's hook and strap, Barnum's rubber dam, and Palmer's napkin holder. These enable many an operator to rejoice and bless the men that brought in these now indispensable aids. My experience, however, has been that the less the mouth is obstructed with large napkins and complicated saliva-receivers, the easier it is to work and control those excessively floody mouths.

With the uniformity in and easily manipulated foils, and some of the preparations of sponge gold, with the much improved cutting and plugging instruments produced by some manufacturers, and earnest operators, combined with *intelligent* mallet force, we are now enabled to make more extensive and durable operations than the most sanguine dreamed of ten years ago.

Beautiful contour or restoration fillings are now quite common, and are being more and more demanded. Teeth with exposed pulps are being treated and saved by the score instead of being consigned, as they are in some localities, to the fell destroyer, arsenic, and the forceps. And those teeth with dead and dying pulps, and even abscessed, that used to give so much torment to patient and operator, are now found to be nearly or quite as manageable as any operation upon the teeth.

I have long since abandoned the long or short preparatory treatment of such cases before filling. When one presents now, I clear it out thoroughly, and if the parts will admit of sufficient pressure upon the tooth, I fill immediately, whether there be an opening or not in the soft parts. I have had considerable experience the past two years with such cases in a convent family, and of necessity rapidity had to be exercised, and the results have been extremely successful, for, out of thirty odd cases, but one gave trouble after the operation, and that of a slight character; none of the teeth thus far have been lost.

Gentlemen, you need have no fear in treating these cases, for if thoroughness be exercised, satisfactory results are most sure to follow.

REPORT

OF THE

COMMITTEE ON MECHANICAL DENTISTRY.

JOHN ALLEN, Chairman.

Your Committee on Mechanical Dentistry submits for your consideration the following report:

In this branch of our profession there seems to be an apparent apathy with many prominent dentists, who cease to do this kind of work as soon as they can fill up their time with operations upon the natural teeth. This is probably owing, in a great degree, to the fact that the dental profession, like that of the medical, is becoming divided into specialties, particularly in the larger cities. This we think is right; for the man who concentrates his energies upon some one branch of business is more likely to excel in that branch than he who attempts more, but in point of excellence accomplishes less.

It is a matter of regret, however, that while the operative branch of dentistry has been advanced within the last few years, the artificial department, as a whole, has not progressed in the same ratio. We think one of the principal causes which retards progress in this branch of dentistry, is the persistent course pursued by many dentists, in making the cheapest, instead of the best work. This low propensity always has a downward tendency, and we would therefore suggest that the opposite course be pursued. Let it be our ambition as American dentists to produce the best work of this kind that can be made, although the cost be greater; for artificial dentures, when properly constructed, are of great value to those who wear them.

In presenting this report, we would first call attention to some of the defects that exist in this branch of dentistry, with

the view of having them corrected. One of these deficiencies is the discrepancy that is often found to exist between the base or plate, and the mouth from which the impression was taken. If plaster of paris be used for this purpose, there is a greater or less degree of expansion as it crystallizes in setting, and a subsequent contraction, as it becomes more or less dry; so that we do not always get an exact model of the mouth. Again, if metallic plates are to be used, metal dies are formed with which to swage them. Here we have a similar difficulty to contend with. Now, we want a method by which we can get a perfect transfer from the mouth to the dies, and from these to the mouth again; and we hope to see a principle developed by means of which this can be done with mathematical certainty.

A good fitting plate can be obtained by the present method of forming them, but it often requires an extra amount of time and skillful manipulation to accomplish it; and some dentists find it more easy to get over this difficulty by resorting to a false theory, viz., that a light plate, of even inferior quality, is better than one of superior properties which weighs a few pennyweights more. To show you that this theory is erroneous, with reference to the weight of a set of teeth, we will simply refer you back to your school-boy days, when studying natural philosophy. You then learned that by the law of gravitation, a substance, though very light, would fall towards the earth. You then also learned that a flat substance, though quite heavy, (placed horizontally,) would not fall if the atmosphere were excluded from one side, while being brought to bear perfectly upon the other; the pressure of which you will recollect is about fourteen pounds to the square inch. But some dentists seem to lose sight of this principle, when they contend that a few pennyweights of additional weight in an upper denture are a great objection to the mode that requires it.

We will now show you the fallacy of this objection, by a simple illustration, with which you are no doubt all familiar, but do not apply the principle practically or perfectly in fitting plates to the mouth. For example: this small piece of paper is heavy enough to fall, under the law of gravitation, but if I exclude the atmosphere from one side of it, as I now do by filling

this glass with water, and place the paper upon it, and thus exclude the atmosphere from one side of the paper while it remains in force upon the other, you perceive that by inverting the glass this paper will now sustain more than three hundred times its own weight and not fall. This is the principle involved in securing artificial dentures in the mouth by atmospheric pressure. Therefore the arguments urged by many in favor of using inferior materials for this purpose, because they are lighter, fall to the ground in view of the facts.

The different materials now in use, as substitutes for gold and silver, are designated as platinum, (for continuous gum, made of silicious substances), porcelain base, rose pearl, cheoplasty, gutta percha, new base, rubber—alias vulcanite, coralite, gumotype, amber base, etc., etc. Each of these substances, together with the different modes of working them, have been brought before you from time to time, and their advantages fully presented, therefore we need not dwell upon this point. It is for you to judge of the relative merits and demerits of these different bases for artificial dentures.

The defective properties of some of these substances seem to render it necessary to substitute some better materials for even the cheapest work of this kind, than those which are now in use.

Another great defect in the construction of artificial dentures with many dentists, is in the mounting of the teeth upon the base, and not adapting them properly to the mouth of the patient; for of whatever materials the base may be, there are evidently grave defects in this part of the work that ought to be remedied, especially in the tone, expression, position, and antagonism of the teeth.

All these points should be studied by the dentist as the artist studies his picture; and it should be kept in mind that the living picture is of far more importance than the lifeless form upon canvas. In order to ascend from mere mechanical dentistry to the more elevated position of dental science and art, let the higher faculties of the mind be cultivated more thoroughly; let the powers of conception, artistic skill and refined taste be nurtured with care. If the dentist will

but strengthen these faculties of the mind, they will enable him to approximate much nearer perfection in the construction of artificial dentures, than by following stiff mechanical rules, as a journeyman does in making wheelbarrows; yet this is the way that many of the so-called mechanical dentists work when they insert artificial teeth. They make Mr. Green's, Miss Prim's, and Mrs. Brown's dentures all alike, with blocks from the same mould, or single teeth arranged with true mechanical precision. Such is Mechanical Dentistry; but we trust the time will come when a mechanical dentist, in the true sense of the term, will be as a thing of the past, and when competent men will become the true representatives of this branch of our profession.

We have no new improvements to report of special interest in this department since our last annual meeting. Those that were then brought before you, still await public indorsement. A different method, however, of forming what is called rose pearl, as a base, will be explained to you by Dr. McClelland, and also a different mode of forming alluminum plates, by Dr. E. Hale. There are new features in both of these methods that were not presented at our last meeting. Dr. Hill, of Norwalk, has likewise a different mode of forming collodion base from that before presented.

Europe is also behind in this branch of dentistry. We can see no new star of hope rising in that direction for our benefit, and we cannot afford to wait for some borrowed light to illumine our pathway. Let us make our own advances, so that the result of our labors may bear the impress of American enterprise. Let us not only maintain our present status, but onward be the watchword, and not rest satisfied so long as there is a higher point yet to be attained. Let others who desire it, occupy the low grounds, but as the representatives of a noble profession, let us ascend to a higher position, where we may do the greater good. Do not be deceived with the idea that the resources of our calling have become exhausted, and that no further advances can be made. As well might we be told that the fountain of human knowledge has become exhausted and that nothing more can be attained.

If this were so, we should not see in this nineteenth century, greater advances in science and art, than this world, old as it is, ever saw before. Thought is the key that unlocks the citadel of the mind, from which hidden treasures are brought out of chaos.

Let us, then, use the faculties with which we are endowed in developing and perfecting, as far as in our power, the profession of our choice.

All of which is respectfully submitted.

ADDITIONAL REPORT

OF THE

COMMITTEE ON MECHANICAL DENTISTRY,

ON

REPAIRING CASES OF VULCANITE.

BY S. B. PALMER.

Allow me to say I have no *pecuniary* interest connected with this subject, and it is not my purpose or desire to perpetuate the use of an article so odious to the mind of this Association as that of rubber. It has against its real worth, numerous patents and high royalties. It is the agent in the hands of ignorant dental impostors, working mischief to an unsuspecting public; and whether employed right or wrong, those who are responsible for its endurance, have found that, like all things earthly, it is liable to fail. Notwithstanding all these hindrances, rubber is used, and will be, until something is brought forward as a substitute.

The little skill required to manipulate rubber, so as to pass for cheap dentistry, invited operators and manufacturers to engage in that occupation to the extent to drive the skill formerly employed in dental laboratories almost out of the mechanical department. I believe there are more who boast, "I do very little mechanical dentistry," or "I make no rubber plates," than there are with us who say, "I am a temperance man, I drink no spirits;" and I confess to have so imbibed this notion of rubber unpopularity, had it not pleased you to have associated my name with the Committee on Mechanical Dentistry, I would not have offered this subject. We give the following, however, in discharge of our duties to the Association, knowing what we offer to be practical and perfectly reliable, and believing that we could offer nothing more beneficial in mechanical dentistry from our own observation.

Preparation of Material.—Take of unvulcanized rubber such as plates are made from, dissolve it in chloroform, keep it in a vial or bottle well corked, ready for use.

Preparation of Case.—For example, we suppose a full upper denture to be cracked between the central blocks, dividing the rim above the teeth and extending toward the centre of the case, or entirely through to the posterior edge, leaving the parts disconnected—a very common occurrence. First unite the parts and retain them in position by wax upon the lingual surface; fill the palatal side with plaster; when sufficiently set, remove the plate from the cast thus obtained, and with scrapers or burrs bevel the edges of the plate from the crack, on the lingual surface, as far as convenient, perhaps one-fourth of an inch on each side, or, if thought best to thicken the plate with new material, as far as adhesion is desired; clean the surface directly under the teeth; cut back the rubber, or bevel the other way, opening towards the palatal surface so as to give a chance in packing to unite with the rim in front. Cut away or file the rim to an edge, no matter if separated one-half inch. When thus prepared, paint all the surfaces, cleaned for the purpose, with the liquid rubber (which works best about the thickness of cream). Replace the case upon the cast, and bind it on with a thread; replace the rim by a piece of rubber cut from a sheet, and to render it more pliable, coat it over with the liquid rubber; mould it in form for the band or rim, using care that no spaces are left to be filled with plaster when it is imbedded in the flask. Next cut a piece of wax about the size to cover all of the painted portion around the break; warm it enough to allow it to bend, and lay it over the part to be repaired; press down the edges with the fingers to keep out plaster; use no heat or spatula, nor attempt to fill under the teeth with wax. When ready, place the case in the flask, using care while oiling or soaping the parts for parting, that none flows under the wax. Separate the flasks without heat; remove the wax, which is done without difficulty, supply its place with rubber, and to be certain of perfect contact with the imbedded rim, coat a piece of rubber with the liquid, and pack it directly beneath the blocks; apply the balance of rubber necessary to produce firm

pressure; close the flasks; warm over a lamp or fire, not in hot water; pack and vulcanize as usual. For the replacement of a block, cut away of the old rubber sufficient to adjust the new teeth, coat the cleaned surface with the liquid rubber, replace the teeth and retain them in position with wax, only warmed; place in flask, pack and vulcanize as before mentioned. In no case do we undercut, drill or roughen the surface of the vulcanized piece in order to receive the new rubber. After a trial of nearly two years, we have yet to see any separation of parts joined where the seam has been opened by beveling so as to obtain pressure in packing. The conditions which caused the first breakage, may, and frequently do, produce a second, which with us has been in the new material, or perhaps in the original. I consider the union just as strong as the solid material, and the bevel or lap gives an increase of united surface which renders a separation impossible. This method may not be new to all of you; so far as I am concerned, it is the result of experiments, to supply a demand, and has the merit of being free to all who wish to use it. The mending of broken dentures is by no means the limit of its utility. In these days of conservative surgery, many other and more expensive rubber fixtures are in use and liable to injury, or perhaps need to be changed. Such has been our experience, and we have overcome difficulties by this method, unsurmountable by mere mechanical attachment, by dove-tail or under-cutting. The joining of soft to hard rubber is very easily accomplished by the same material.

That principle in chemistry which hardens prepared rubber by vulcanizing is not set aside by the use of chloroform, which only softens it, as the chloroform is evaporated on exposure to air or heat; and it may be a saving of trouble to remember that another law, which recognizes wax, gutta percha, oil, or soap, as agents to prevent rubber from being vulcanized, is also unerring. We are benefited by conformity to nature's laws, but those laws change not to favor us.

ESSAY

ON THE

"COMING BASE."

C. M. WRIGHT.

There is an unwritten rule that seems to be well understood in our profession, that every member shall contribute his mite of knowedge to the general fund. Not being able to be present at the meeting of the Association, and having a mite of knowledge on a subject of interest, I beg leave to contribute it in this form.

There is a demand for a new base for artificial teeth, that will take the place of rubber with the profession and with the people. This demand expresses itself in the many experiments of dentists, East and West, after a new base. The advertising columns of our journals—the circulars that come to our post office boxes—the applications to the Patent Office, by dentists, show plainly that a base for artificial teeth is the desideratum. The "coming base" is eagerly looked for and expected, and it is about this "coming base"—this substitute for rubber—this "base of the period," that I should like to say a word. I am not the fortunate inventor (needless to say), nor am I interested in its acceptance by the dental profession, more than any one of you would be were you acquainted with the material and its adaptability to the purposes of the mechanical and artistic dentist. I refer to the material and method introduced to dentistry by Dr. J. A. McClelland, of Louisville, Ky., and known as "Rose Pearl." It is pyroxylin, or consolidated collodion, coaxed into forms easily managed, and made perfectly docile in the hands of expert dentists.

After nearly a year's constant and extensive use of rose pearl, and opportunities of seeing experimental plates over two years old, still worn by patients, I feel capable of forming the opinion

and announcing the fact, that rose pearl is the material long sought for, long hoped for, by the intelligent dentist, *as the base for artificial teeth.* It is entirely free from the objections that are to-day urged against vulcanite by the most scientific of our members, while for accuracy of adaptation to the palate and alveolar ridges, for compatibility with the sensitive tissues, and for its imitation of the color of the lining membrane of the mouth, it is superior to any material with which we are acquainted. It is indestructible by acids, and the fluids of the oral cavity seem to have no more effect on this material than they have on the porcelain teeth, unless it is to enliven the surface and make it look more like the real mucous membrane. This I have noticed in very many cases. The manipulation necessary to bring rose pearl into the required forms of plate and gums is simple, only requiring taste and a degree of skill, the want of which alone should disqualify any man for the practice of a mechanical profession.

The material is offered, for our convenience, in two forms, in evaporated sheets for dental plates, and in a comminuted state for the gums and attachment. If it will be permitted, I should like to state rapidly the method of making a set of teeth on rose pearl. An impression of the mouth is taken in plaster or wax, and a model obtained in plaster. This is moulded in sand, and taken in an easily melted compound of metals, *tin and lead.* A counter model of the same metal is made, and when in "gold work," we would *swage* our plate, in rose pearl we warm in boiling water, and press in a screw press of some power. This will give us a beautifully distinct, evaporated plate, as immutable as gold plate, and on which every line in the plaster impression is copied. Upon this hard, clear, elastic, and permanent plate, single plain teeth—made by Mr. S. S. White, especially for this work—are arranged. (The block, gum teeth, for vulcanite, can be used as well, if a porcelain gum is desired.) Plaster of paris is then built about the teeth and carved like the natural gum, according to our taste, giving us the opportunity to engage our artistic ability, in restoring to the face natural and pleasing expressions. The carved plaster gum is the model for the rose pearl gum, to be afterwards added.

The piece is then placed on the metal model or die, and a counter die is poured over the teeth, plate and plaster gum. This counter die is generally of metal poured in sections, though plaster may be used. The sections are then separated, the plaster model of the gum removed, and the rose pearl put in its place and pressed. The comminuted material used for the gum is made pasty and soft before pressing, by its solvent, sulph. ether. The *labor* is then at an end. A number of hours is required for the evaporation of the ether used to soften the gum material, and the piece is ready for finishing. It receives easily a high polish, and presents a very attractive appearance. The whole work is but little more than that given to a piece of vulcanite, and it is cleaner, more artistic, and far more satisfactory when done; for we have built up an artificial palate and alveolus of a natural color, which looks like a unit, with no joints, no patches, no insufferable rubber and sulphur odor.

The time required for the evaporation of the ether, might, and does at first seem an inconvenience, but it is because we have become so demoralized in our ideas of *time* by the use of a cheap substance that requires but a few hours and little skill to make into plates. We have acquired the habit of wishing the disagreeable work and the unfortunate patient "off our hands" at the earliest possible time. In practice, the time required for rose pearl to fit *herself* for the mouth, is soon regarded as gain, rather than loss.

In partial or temporary cases, where time is an object, an evaporated plate may be pressed, and tried in the mouth an hour after the impression is taken. In these cases, a strip or band of gold plate is pressed on the rose pearl plate around the ridge, to which plate teeth—plain, or with gums—are soldered. The gold plate is securely riveted to the rose pearl. In cases of full or thick alveolar ridges, where it is impossible with any other to make an artificial gum, we can use rose pearl, for it can be made as thin as the paper on which I write. For irregularity plates, rose pearl is superior to anything the profession has ever known. A seasoned plate can be pressed with a band over the bicuspids and molars and around the outer circle of the alveolus, under the lip, to which, ligatures, rubber bands

or other attachments may be fastened. For this necessary work alone, it would be a valuable addition to our materials, as time and trouble are saved, and ingenuity greatly assisted. For difficult cases, for any case where any other material can be used, rose pearl can be made successfully; and where entire dentures are necessary, its lightness, strength, simplicity and beauty, make it the most desirable material we have.

Perhaps my encomiums seem too great—perhaps I write too positively in its favor to appear impartial or disinterested—but if I am positive, it is because my knowledge of rose pearl, in its practical use, is positive, and not at all speculative; and it is because I am supported in my opinions by those among you whose knowledge and experience make them authorities, and whose acquaintance with rose pearl makes them warm friends of this *new base.*

Every new thing has enemies; every good thing in mechanics, science and art; every valuable invention that the world has ever known, when new, had enemies. There are always to be found croakers against the new—persecutors of new things—objectors to new ideas. They form a class. They regard themselves as conservatives, though they frequently are very radical stumbling blocks in science's path. Our profession is not free of these stumbling blocks, though *as* a profession we may wash our hands of this fault, if our records may speak. But I digress. Rose pearl, though only old enough to have proved her value to some, and to have demonstrated her good qualities, has enemies. These constitutional objectors have hit upon a happy word, which, to their minds, Herods the infant rose pearl. This little word, which is so potent, is pronounced with a peculiar whistling shrillness, and when emphasized properly is very annihilating. It is "shrink." "Rose pearl is pretty, but it *shrinks.*" "It *shrinks,*" and should die.

The shrinkage of the material is in the evaporation of the ether that softens the gum, and is controlled by such simple means that the cry, "*it shrinks,*" becomes one of such ridiculous insignificance, that the friends of rose pearl would laugh, were it not that a little word, a watch-word, has so frequently such power with the masses.

REPORT

ON

DENTAL EDUCATION.

M. S. DEAN.

MR. PRESIDENT AND GENTLEMEN:

As one of the members of the Committee on Dental Education, I present a short paper, which may be considered as a preface to what may follow, on the subject of Office and Collegiate Instruction, from another member of the same Committee.

Believing, as I do, that the time has come when the profession should exact of its pupils a better education than it has generally heretofore, and believing that the controlling power to introduce a more liberal culture, and certainly the duty of taking a broader view of the subject than can be taken by any single practitioner in his ordinary practice and range of influence, lies with this body, which represents collectively the learning and influence of nearly every State in the Union, I have thought it not inappropriate to occupy a few moments in considering the importance, and even necessity of a good preliminary education, as an aid to the dental student, and as an essential attribute to the dental practitioner. In doing this, I have purposely omitted the strongest argument in favor of education, viz., the ennobling influence it has on the mind and character of the man as man, and the internal gratification which it, and it alone, can give. And I have done this, simply because the subject is so well and thoroughly treated elsewhere in a thousand different forms, in literature which must be familiar to you all. I have, therefore, confined myself to the narrow

and almost selfish limits of the usefulness of a thorough education to the dentist simply as a dentist.

Whether the field for intellectual research appear less inviting, or the range too narrow, or from whatever cause it may be, the fact is palpable that fewer Baccalaureates have found their way into our profession than any of the others,—fewer indeed than have entered the commercial ranks. And yet, we think abundant opportunities are offered in this profession to every man for the application of collegiate learning, and that he may turn to good account all the instruction and pleasure which he may derive from the best culture he can get.

Although the *utility*, in general, of classical studies has been strongly controverted, public conviction is evidently firmly settled in their favor; and the Greek and Latin classics are generally considered indispensable to a good education. They are, doubtless, a valuable, though not an essential, qualification to the dental student, as well as others. They should never be gained, however, at the expense of the fundamental branches of learning.

Without fixing any definite point at which the student should arrive before commencing the special study of his profession, a matter which in this country must depend largely upon the advantages in each particular case, we will lay down the following propositions which we shall endeavor briefly to maintain, although they may appear *obvious* truths:

1st. A good preliminary education is absolutely essential to one about to enter upon the study of dentistry.

2nd. *Complete success* in our practice, and operations on the teeth, depends, many times, to a considerable degree, upon a superior general education.

3rd. Our profession needs the *refining influence* which a "liberal education" gives.

4th. Our profession must be brought up to the *test* standard of a "learned profession," or it will lose much of the power and influence which it has already gained.

I. As our profession is based upon and intimately connected with the various sciences, a thorough preliminary education, if not absolutely indispensable, is highly important to one about to enter upon its study.

It familiarizes him with the *instruments* he must use in acquiring professional knowledge. He learns *how* to study, and acquires the *habit* of study. He thinks logically and acutely, and comprehends and enters more fully into the *subject* of study. Having learned how to use his powers of thought, it gives him the same advantage over one who has not received this mental discipline, that the practiced chess-player has over the novice; and more—for he has not only learned how to use his mental strength to advantage, but by exercise, that strength has been developed and increased. For this reason, we claim that such preliminary studies as mathematics, some natural history, mental science and others, though they may not *in themselves* be of practical utility in his profession, are needful auxiliaries in obtaining a thorough knowledge of it. Whereas, chemistry, and the physical sciences, especially furnish much prepared material all ready for use, which may be easily wrought into the fabric of his profession.

The dental student who commences his pupilage with his mind stored with the rich knowledge of these sciences, must possess an incalculable advantage over his fellow student who is destitute of such preliminary education. While one, has become familiar with the principles of architecture,—laid the foundation, and gathered much appropriate material to build his professional superstructure with; the other, has these principles yet to learn, the groundwork to lay, and all his materials to collect and arrange. If each is endowed with equal, natural, mental gifts, and receives the same tuition and college instruction, how vast the contrast must be in the professional acquirements of the two.

II. *Complete success* in our practice and operations upon the teeth, depends, many times, to a considerable degree, upon a superior general education.

Although it may not be a very prominent element of success at all times, yet we think it of sufficient importance, even in this limited sense, to command the serious consideration of our profession, which is now ready to seize upon any and every

thing which may tend, in the slightest degree, to secure better practical results.

Manipulative and artistic skill have, we think, outstripped education and science, and have nearly reached the goal of human perfection. Advancement in general education, if it do not increase our professional skill, will most certainly increase our ability for *using* that skill more advantageously. For, it creates or secures a more implicit confidence in our employers of our *capableness* for performing whatever we undertake, understandingly and correctly. This, as a rule, however, is not without its exceptions, but the exceptions are rare indeed compared with those comprehended in it. For, if we are possessed of a good education, it cannot be covered up nor concealed from our employers; and whether their judgment be correct or not, it is, to them, *circumstantial* evidence, at least, that we are well grounded in the principles that underlie our specialty, and consequently, their confidence in our professional knowledge and ability is greatly strengthened. And this confidence is the means to which we have alluded as increasing our ability for using the skill we may possess.

It will be readily conceded that where this perfect confidence exists, the patient suffers less painful anxiety—indeed, less real pain, and the operator is permitted to proceed with far less embarrassment, encountering less difficulty, and accomplishing better results, and with greater ease to himself. We therefore conclude that a good general education is highly essential to the practitioner of Dentistry; that it lessens the discomfort of the patient, facilitates the labor of the dentist, and increases the value of his operations. And, as the aggregate of those who employ our services, and sustain our profession, possess a greater average amount of refinement and wealth than do the patrons of any other profession, education, refinement and skill, or any other quality that contributes in any degree to palliate human suffering, will be sought after, and its exercise rewarded; so that, if education imparts confidence, and confidence renders our operations less painful and more perfect, our services become more valuable, and will command a higher price. And here we have a *pecuniary* incentive, also, to base our professional studies upon a good preliminary education.

III. The limit which I felt obliged to assign for myself at the outset, excluding, as it does, the consideration of the general effect of a liberal education, necessarily hampers me somewhat in the discussion of my third point, viz., the refining influence of education upon the dentist, and its advantage to him simply as such. It is precisely in these points, in which education is good for all, making them better men and citizens, that it is of most advantage to the dentist. For we know well that, after all, our professional character is but a small part of our whole being, and that any process that makes merely dentists is pernicious to the better faculties of the mind. It differs only in degree from that degrading division of labor, in densely populated countries, which devotes the lives of multitudes of artisans with minds and souls, to the single manipulation required in making a pin head. But, on the other hand, the same cause relieves one of some difficulty also. Many considerations are strongly urged every day by the best minds of the world, and have been urged for ages, in favor of education generally, which have now become a part of the common sense, and almost of the instincts of mankind. These, therefore, need no further consideration in reference to any particular profession. Every one sees, without suggestion, that the constantly deepening and broadening cultivation, which has raised the world to its present degree of civilization, must be good for the dentist, not less than for the rest of mankind.

There are, however, a few points in which culture is beneficial to the dentist simply as such. Dentistry is at once the art of restoring the beauty of the human features, when impaired by accident or disease, and, in its modern development, the art of healing. The ministry of healing demands for those who practice it, a higher degree of refinement in feeling than almost any other. The practitioner has to deal with pain, and that by operations and appliances which often in themselves have a tendency temporarily to produce pain. There is nothing more repulsive than a boorish or brutal physician of any kind. The association of rude manners, or even clumsiness, with the sensitiveness of the body when attacked by disease, strikes us at once as unfitting. It happens also that the services of the

dentist are oftenest required by the female sex, which, by its nature and culture, is more sensitive than our own to rough impressions. The dentist, then, needs, in the prevailing roughness of American society especially, some special culture to soften his character, and make a thorough gentleman of him in the true sense of the word. It is true, that true gentlemen are born in all stations of life, and our profession is full of examples of acute sensibility, wide sympathy and large hearts, among men who have had no more culture than they could by their natural taste take in and assimilate from the roughest surroundings; but it is also true that, other things being equal, it is the common sense of mankind that literary cultivation—the acquaintance with the best thoughts of all ages and countries—tends, as nothing else does, to make gentlemen in the sense in which we here use that frequently much abused word. The manner in which, as civilization has advanced, the liberally educated members of the other branches of the healing art have crowded out the uneducated boor, would alone be a sufficient proof of the necessity of a generous culture for the members of our branch who alike have the noble office of ministering to a body diseased.

The advantage of an artistic taste in those manipulations which repair the irregularities of nature, and supply the losses from accident and disease, needs only to be suggested to be fully realized by you who have often alike at times rejoiced in its possession, and felt the want of it in a higher degree. There is no branch of dentistry that has improved more in the last twenty-five years—nor less in the last ten—than that of mechanical (?) dentistry, which seeks to imitate nature's best models in cases where for any reason she herself has not attained, or has lost perfection. The best members of our profession—in this branch at least—are those who possess the most of this artistic taste. Now this quality, of all the mental powers, is least capable of being acquired by direct study to that end. It is something you cannot, in fact, learn—it must grow in you. It is so closely connected with the highest development and most careful cultivation of the powers generally, that nothing but an education of the broadest and deep-

est kind, a close intimacy with the masters of science, of literature, of art, in all times and places, can plant its seeds or foster its growth.

The pursuit of a specialty like mechanical dentistry, however earnestly and faithfully followed, and indeed almost in proportion to that earnestness and faithfulness, has a tendency to narrow rather than broaden the scope of the mind. By long practice, we may, it is true, acquire skill in manipulation; but the artistic insight, the just view of harmony which makes the artist, comes not by any mere mechanical dexterity, or even fecundity of ingenious devices. These are the body, the instruments only; the true soul, the acting agent—*art*, in fact—belongs to the higher part of the intellect, and grows only by the celestial food not to be obtained by mere grubbing, but which is transmitted freely to whatever mind is in communication with nature and her children, whom she herself has fed and enlightened. Science, literature, art — in their widest senses—are the storehouses where her children have from time to time stored her ambrosial food.

So far, then, as our profession aspires to be gentle in relieving pain, to be tender to the suffering, it needs the refining influence of liberal culture. So far as our profession has any claims to be considered as an art, as distinguished from a mere mechanical trade, so far it needs to foster the growth of the soul of art, by a wide and generous supply of mental pabulum.

IV. Our profession must be brought up to the test standard of a "learned profession," or it will lose much of the power and influence which it has already gained.

Our profession has been so rapid in its growth, and has flashed so suddenly and meteor-like into eminent notoriety, that it has fairly dazzled the *sensational* world; and its achievements in the arts, and many branches of science, have been so brilliant and unexpected, as to attract the attention and command the admiration and respect of the scientific and learned of every civilized nation on the globe. Indeed, so marvelous have been the mental and physical accomplishments of this immature youth,—this dashing offspring of medicine—that it has already (though with some misgivings) been admitted to

the companionship of the "learned professions." Not so much for its *established* reputation for scholastic acquirements, however, as for its acknowledged practical usefulness, and its *growing* and *prospective* claim to that high position. Hence, in order to hold even the position which it at present occupies, it can do so only by *continued* labor in building up and strengthening the educational basis upon which it must rest. For, when its past achievements cease to dazzle the eye of the public, and their vision becomes clearer, its defects will be more plainly seen, and its *faults of education* will be more glaring, and more severely criticized. The higher our specialty has been raised to view, the more conspicuous will our imperfections appear. And these imperfections will be found *chiefly* in our defective education, both general and special, and must be polished out, or they will ever mar the beauties that surround it. What seemed perfection a little while ago, is now either improved or abandoned. The rude shanty whose unsightly walls sheltered the grateful traveler a few days ago at Idaho City, and was considered by him almost a luxury, might now proffer its hospitality in vain,—even without money and without price, for that young Saratoga of the West already affords the luxuries and elegances which attend the rapid progress of civilization. So our profession, which to-day, in some respects, seems to have reached the very *ultima thule* of perfection, must bestir itself, and add to its acquired skill those moral and mental beauties which education, in its broadest sense, can only give, or, when contrasted with the progress which is being constantly made in the various arts and sciences, it will lose its relative position, certainly,—and *seem*, at least, to have lost ground in reality. And this education must be mainly secured before entering upon our professional studies. Although it be true that much proficiency may be made in many branches of education after we have engaged in practice, if we employ our leisure hours in well-directed study; yet, unless we have previously attained a knowledge of the fundamental sciences, we labor to a great disadvantage, and our acquisitions must necessarily lack the harmony and completeness of finish that should characterize a learned profession. Besides, in con-

fining ourselves to these studies at this time, we must—as the saying goes—rob Peter to pay Paul. For we steal the time that legitimately belongs to professional study, and the pursuit of general literature. We must be students before, as well as after we become dentists, or our profession will eventually sink to a mechanic art. Unless our efforts to raise our noble profession to a more exalted rank among the learned professions be earnest and *unremitted*—if we withhold our energies ere it rest securely upon the top of the hill of science, it will, like the stone of Sisyphus, rush back to the level plain from whence it started.

And now, gentlemen of the American Dental Association, you who have done so much for the profession of your adoption—I may say *creation;* you, who have encouraged and instructed the weak, and stimulated to action the strong; you, whose masterly efforts in developing the science and perfecting the art have been so successful; you, whose pen has never been idle, whose voice has never been silent, in promoting the honor and usefulness of your profession;—upon you now rests its future prosperity; upon you rests an important duty which must be the crowning act of your lives; upon you devolves the responsibility of guarding the doors of your profession against those who may lack the essential requisites of a learned profession—A GOOD PRELIMINARY EDUCATION.

ESSAY

ON

DENTAL EDUCATION FOR THE PEOPLE.

BY S. B. PALMER.

The profession of dentistry, still in its youth, expects not that degree of veneration from the public usually bestowed upon the gray locks of older professions. It has shown for itself, however, all the life, perseverance and achievements exhibited by the aspiring student working his way to obtain a college education. With dental colleges distributed as they are through the United States; with text books and numerous periodicals filling our libraries and dental associations, for personal instruction, exchange of thought and modes of practice; the provisions for a dental education are well established. Liberal minds are engaged to carry the work forward, so that those about to enroll themselves dentists, may occupy positions agreeable to themselves and honorable to the profession.

With these facilities, scores of worthy young men go forth every year from dental colleges, bearing the title of Doctor of Dental Surgery, and we are in sympathy with them, as they travel from place to place, in search of a practice to meet their high aspirations.

The conclusion too often arrived at is, that the supply of dentists exceeds the demand for their services, which, if looked at in a commercial point of view, lowers the price. We expressed sympathy for this class of men because they have made an effort to start right, and we notice the teachings inculcated at dental colleges have some of the adherency of instruction received at West Point Academy, which gives its

graduates a physical uprightness, strengthening the spine and imparting a lasting military air.

Graduates from dental schools possess the same teachings in a moral sense, in other words, they are apt to have more "back bone," to stand erect in support of science and skill, than they would have had, if taught by a stooping preceptor. On returning to the subject of supply and demand we say, no intelligent professional man has a right to look upon skill from a mere commercial stand point.

There is plainly visible two classes of dentists, and a corresponding adaptation of patients. This division is no more marked by an educational line than by professional and commercial distinctions; and we trust the object of this association is to aid in elevating both dentists and people from a low plane of common traffic to a respectable professional platform. We have little fear that the subject of dental education will be overlooked as applied to dentists; it is overlooked as applied to the people. A few only of dentists, as compared with those who profess to practice, ever attend associations or try to improve themselves. What we must do is, to put in practice those good intentions hinted at in former meetings of this body. Let the delegates who leave this hall feel that they have something to do for the edification of their patients, if they would expect their patients to appreciate their skill.

Not only would we enact measures of recommendation for each to do, but by committees or otherwise, put into the hands of each something to do with. It may be well for the dignity and high standing of this association that its transactions are bound in a nice volume and added to the libraries of its members annually. It would be better for us and a blessing to the recipients of our operations, to have this subject discussed, the practical conclusions executed, and through the profession carried to every home where a periodical or newspaper is taken or read. We believe that the public can sooner be educated to appreciate skill and prepared to pay for it, than dentists who are strangers to such attainments can be induced by pledges or price lists to demand professional fees for mere physical or mechanical labor.

The better class of dentists acknowledge dentistry a profession in which skill and talent are necessary to success. We have only to take observations in literature, science or art, to see that price does not bear the same relation to labor as in the manufacture of articles bought and sold in shops. Skill is not put in the market in packages or bottles like patent medicines, neither is it on equality with articles of commerce. And what is needed most in our profession is, to have dentists individually fix some price upon the skill they possess, however low it may be even by their own estimation, and stand by that. We do not condemn acts of charity, nor would we encourage exorbitant charges, but the habit and practice of bidding below our own standard merely to retain the case, is unmanly, unprofessional, and an evil which, with the next step to degradation sure to follow, the relaxation of energies, and use of base materials, serves to fill the lower realms of dentistry with shopping patients and dentists anxious to supply their demands. In the better class of dentistry price is not so much changed by supply and demand; the requirements are for skill. And who will pretend to possess all the skill necessary to do in all cases as he would wish? No one but an egotist. All the skill and knowledge a dentist can bestow is sought after and paid for.

The patients who sustain a first class practice are appreciative; most of them are graduates, or the offspring of graduates, from some dentist's chair of the same faith and order; with such there is no questioning as to the cost of the gold to fill a single cavity, or how many can be plugged in a day.

When the artistically educated man wishes a thousand-dollar painting to adorn his walls, does he ask how long it took the artist to paint the piece, or how much the canvas and paints cost? If he sees one thousand dollars' worth of the artist's skill crystallized or rendered visible upon canvas, he purchases the skill and not the labor and paint.

Such manifestations of skill are not found in temporary auction rooms, or sold cheap by traveling agents. As science advances, so does the taste of the people and their ability to judge of merit. This kind of education is carried to nearly every home by magazines and newspapers. Of the science of

dentistry very little ever comes to the knowledge of the home circle. Many dentists now in practice remember when the office and laboratory were closed even to members of the profession; when the knowledge a dentist possessed was selfishly held secret, for personal emolument. Thanks to the liberal-minded who have opened their doors and their hearts to those in pursuit of the science, and have said, Come, learn of us, and we will do you good.

Much good has been accomplished by such liberality; hundreds of dentists who, to-day, stand well in the profession, but for such assistance would have been only pretenders. The limited number who improve the opportunities offered, but show that a large proportion of dentists are satisfied with their present attainments, and care for little beyond their own practice. Yet we should not falter. The success of the past ought to stimulate us for the future. If we cannot carry the dead weights of the profession, let us benefit the people who in turn will repay us. The provisions are ample for dentists to obtain an education, and we trust will continue to increase with the demand; and we believe there is no better field for benevolent labor for the upbuilding and support of dentistry than the education of the public to understand their own needs. This knowledge may be unlike that required to perform the operations. It is the dentist's mission to know what ought to be done, and how to do it, and his task is rendered comparatively easy when his patient, too, knows what should be done, and is educated to appreciate the skill required to perform the operations.

Our success depends upon the people to judge for themselves who are charlatans and who are not. Did they know of the evils brought upon them by dentists to whom they have applied in confidence for advice, who, for the very low and unmanly reason that the advice so rendered would best answer the ends of the operator, even at a sacrifice of the patient, we would hardly wish to hear the decision of those so basely treated, and yet but few ever know of the imposition. A few years ago, a dental laboratory was as high in position as the operating room, and the same skill was bestowed in one as the other; at present,

many boast of having no such apartment as a laboratory. The name has associated with it, low dentistry and high royalty.

The fact that the mechanical department in many places has been wrested from the professional standing it had attained, and is now carried on by persons who could in no way make a gold plate, much less insert a good gold plug, has caused a division of labor, or, rather, has driven from the laboratory much of the skill required for successful operations; as a result, our rural districts are largely supplied with dentists whose practice is based upon their mechanical abilities, and receive their support from the ignorant and credulous public. Is it not our duty to carry intelligence directly to the people,—not only to inform them of the importance of proper attention to their teeth, but to avoid the evils imposed upon them by empirics? We well know that our patients could not be induced to try experiments or resign the care of their teeth to a dentist of whom they know nothing. The reason is simply this, they have a proper idea of the value of teeth, and understand pretty well the difference between a profession and a trade, or scientific and physical labor; they only know this by the lessons taught them generally by dentists while attending to the duties of their profession. There are thousands of people who would be as thorough to attend to the preservation of their teeth as those composing our practice, who, at present, have but a poor opinion of dentistry, and that rightly founded upon observation and experience.

We can classify a patient, though previously a stranger, by learning who has been his dentist, by the condition of the mouth, the material and its application in plugging the teeth, or by knowing the state of his mind respecting dental fees. A cleanly set of teeth and fine gold fillings, if any, is taken as a diploma that the patient has, at least, a high school dental education. On the contrary, a neglected condition of the teeth, and an uncalled-for number of amalgam fillings, are assuredly evidence that there is but a common school education, and the "teacher boarded round."

While operating for the latter class, we see our task not only to perform the required operations but to instruct patients

to attend to their portion, as our reputation is always coupled with the success of the operations which must be intrusted with the patient. Much is done to enlighten patients by these private lectures, but we must go beyond our own practice, if we expect to reach the masses. Other and more general means must be employed, and it is now in our power to put in motion agents to accomplish this object; whatever course is decided upon, experiments show must be simple, comprehensive, and free to those to be benefited. The People's Dental Journal aimed to accomplish this; its pages were rich with intelligence such as every family ought to possess, yet few of those in need of such literature ever saw or heard of that periodical; it cost something, and was not supported by the people.

Individuals have issued cards and circulars with good results, perhaps to a few connected with their practice, yet this plan is weakened by the flaming handbills of some pretentious dentist in the neighborhood, covering the whole ground and enough more to cause modesty to blush and retire. Our code of dental ethics could easily be interpreted to condemn individual action of this kind, though in spirit such is not intended. We do not claim to have originated the ideas we advocate. This subject has been before you. Good resolutions have been offered which have been of as little utility as laws upon statute books unexecuted.

May we not, by committee or otherwise, publish a tract or circular containing such instructions as parents need, to cause them to look to their children's teeth; give them to understand that much mischief is done by premature extraction of temporary teeth; that permanent teeth are developed at an early age, and of all the most liable to decay; also, the necessity of keeping the teeth clean, and the best way to do it? We believe that the distribution of such circulars would stand in fair comparison for public good with those on religion or temperance. Sanctioned by this association, such circulars would be purchased by the thousand and given to the people, not only by the members of this body but by the majority of dentists in the United States. And from such an article, extracts could be taken for newspapers which would be readable and instruc-

tive without the appearance of advertising. We read articles and extracts from medical books, Hall's Journal of Health, etc., and are benefited by them. Do we ever read that in youth the teeth require constant watching in order to preserve the full number? We can hardly help reading of the late wonderful discovery of sozodont, and are told that that will do it; the people show their anxiety for some good thing by trying the experiment. Is it just for us to censure their credulity, when we furnish them even nothing, and know what they need?

There are two sufficient reasons for prompt action in this matter:

1st. The duty we owe our fellows as members of the great human family. To do them all the good we can, calls for us as dentists, to impart just this knowledge.

2nd. With the increasing number of dentists, whoever would expect to find the right practice, must go to work, build up and support it; the materials are in the people, it is our work to mould, fashion and polish these for use; by so doing, a like benefit is enjoyed by the profession and the people. The appreciation of skill must precede the payment for it.

We read that a diamond was recently picked up in South Africa, rivaling the famous Koh-i-noor in value, which was sent to England and insured for £3,000; yet the man who found it sold it for five hundred sheep, ten head of cattle, and a horse. The value was in the diamond, but Africa was not the market for it. So our best dental operators could find African markets for their diamonds by the journey of a few miles into the country. The cultivation for sculpture, painting, flowers, etc., elevates the public mind. A knowledge of the dental art offers higher rewards than to please the eye—nearly all the senses are gratified by its proper application.

In conclusion, may we not at once set about this work, and provide the public with that kind of education and literature which is their due and our duty?

REPORT

OF THE

COMMITTEE ON DENTAL THERAPEUTICS.

E. A. BOGUE, Chairman.

Your Committee on Dental Therapeutics would report, that since last year there have been added to our list of general remedies no new ones, so far as they are aware, but that the Materia Medica is being drawn upon more generally than heretofore, each year, by our profession, while the few remedies which in our hands are the most frequently used, are being somewhat better understood, both as regards their physical characteristics and their medicinal action.

Callendula is being admitted to mitigate the discomfort of chafing, from operations; acetate of morphia, and carbolic acid in combination, to allay the sensitiveness of dentine; iodine, or carbolic acid covered by collodion, to prevent the oozing of mucus from the gums during operations; tincture of aconite root locally applied to allay the acute pain of periodontitis; a saturated solution of camphor gum in chloroform, to allay and to prevent the pain, and to clear the pulp canal in the treatment of cases of long standing ulceration, either chronic or acute, as well as upon the gum as a rubefacient when the formation of pus has taken place and determination to the surface is desired. Cold water and even ice is used to advantage, such as would scarcely be credited by one who had not tested it in the first stages of peridental inflammation. The puncture of the tooth pulp during the active stages of its inflammation, has scarcely received the attention it deserves from those whose highest aim

is conservation and prevention. It is well to base all our practice upon principles, and yet it may be desirable to mention the mode of performing certain unusual operations, and in that connection, the indications that point to their performance. Therefore, with so much of an apology, the stages through which the vitality of the dental pulp is lost, will be briefly indicated, together with the proper remedy to be applied in each of those stages.

In simple exposure of the pulp, pressure, cold, or some direct irritant, is the usual cause of pain; the remedy, therefore, is analogous to that applied when pressure of a portion of the skull upon the brain is to be treated,—remove the pressure. If pain be still present, ether, or camphor and chloroform, will often relieve it temporarily; then, if we are convinced that inflammation be not yet set up, or be so superficial that the cautery will embrace the whole of the involved portion, we apply pure carbolic acid, in crystals if possible, to the pulp and cavity, and with a small amount of the agent still remaining in the cavity, cover the exposed portion of the pulp with oxychloride of zinc, being careful to absorb, as we put it in its place, all the superfluous fluid. Now covering this with gutta percha in some shape, Hill's stopping being as convenient a form as any, we shall probably have the pleasure of finding our patient free from pain.

If, at some subsequent time, we shall insert a gold filling, and afterward find pain supervening, we must then examine for irritation or inflammation of the pulp. If in our examination we find the tooth to be acutely sensitive to cold, and yet more sensitive to heat, not sore to pressure or tapping upon it, yet generally incommoded by it, we may suspect the condition to be one of congestion of the pulp; if throbbing within the tooth be present, our diagnosis is the more certain, and the indication is to relieve the pressure which in the soft parts would be shown by swelling. We prick with our lancet, the gum opposite that point in the tooth where the pulp is the largest, then with a fine and sharp drill of a screw shape, so that it will clear itself of fragments, we drill through the alveolus and the root of the tooth to the pulp, aiming to wound

this latter just enough to cause the flow of a minute quantity of blood from it. Here we have a vent, not only for the escape of the blood extravasated by the instrument, but for the relief of the little swelling that may yet supervene, and the probabilities are in favor of a complete recovery within a few days, the pain disappearing in a few hours at most.

If now, instead of being able to drill into this pulp at the moment when the abstraction of a small quantity of blood would relieve the pressure and prevent stasis and the consequent death of the pulp,—we are unable to see the patient until the pulp is dead, which is indicated by absence of sensitiveness to heat and cold, sometimes by soreness to tapping or pressure, sometimes by a swelling upon the gum, it will be utterly in vain to drill into the pulp chamber to prick the pulp, the six or eight hours that have elapsed since the time when that treatment would have been effectual, having rendered useless that operation, the trouble now having been transferred to the apex of the root, or to the investing membrane external to it.

If we have pain and tenderness to pressure, we shall need to remove our filling, and cleanse the root free from the dead pulp, and treat it for the external inflammation. And here there is no need to go into minutiæ, as the mode of treating an ulcerated or inflamed investing membrane is familiar to us all.

If the cavity and root both be filled, it will often be of more use to make cold applications and try to dissipate the swelling or rather the inflammation that precedes it, but if, after all our efforts, we are unable to reduce the pain and swelling, then it will be far better to pass the lancet and drill through the gum and alveolus to the apex of the root, and then, if need be, apply poultices upon the gum, or chloroform and camphor, or other rubefacients, and determine the abscess to the surface, after which, we may generally clear out our abscess, and by applying iodine, or chloride of zinc, promote the healing process and shorten the period of suffering.

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS.

Your Committee of Arrangements beg leave to report that they entered upon their duties with the full determination to make this meeting in every respect an entire success, so far as lay in their power, and to that end secured the use of the Union Hall and two adjoining rooms, but unexpected difficulties in the acoustic properties of said hall, compelled the removal to another hall, which, upon trial, was found equally deficient. After much difficulty, and through the kind efforts of Dr. Rich, of this place, to whom the Committee and this Association are truly indebted, the rooms of the Young Men's Christian Association were secured.

The Committee regret the annoyance and inconvenience to which this Association has been subjected by these changes, but feel that they are not culpable, inasmuch as it was beyond their ability to foresee these results.

Further, your Committee entered into arrangements with Dr. W. C. Horne to furnish to the publishing committee a full report of the discussions had before this Association, during its present sessions, for which labor they have agreed to pay to Dr. Horne the sum of one hundred dollars.

Respectfully submitted.

J. G. AMBLER,
L. S. STRAW,
Committee of Arrangements.

REPORT

OF THE

COMMITTEE ON VOLUNTEER ESSAYS.

M. S. DEAN, Chairman.

Mr. President:

Your Committee on Volunteer Essays beg leave to present the following report:

They have received three papers only, which come under this head.

One of these, entitled "The Coming Base," purporting to emanate from the pen of Dr. C. M. Wright, of Louisville, Ky., is a well written article, advocating the superior qualities of Rose Pearl, and detailing the mode of mounting teeth upon this base. The time consumed in reading this paper would be, perhaps, from ten to twelve minutes.

They have, also, in their hands what they consider an able paper on the subject of "Dignity, as a necessary qualification for a dentist," by Dr. Isaac Woolworth, of New Haven, Conn., which they think the Association will find interesting and instructive.

The other essay, written under the head of "Physiological action of nitrous oxide gas," by Thomas Evans, M. D., D. D. S., of Paris, France, is, doubtless, an able article upon that subject; but, as it was written for the *Dental Cosmos*, and is the continuation of an article which has already appeared in that journal, and is to be *continued*, your committee consider its admissibility here of doubtful propriety. With this brief statement of facts, the Association must determine whether they shall be received.

REPORT

OF THE

COMMITTEE ON DENTAL INSTRUMENTS AND APPLIANCES.

Mr. President:

The Committee on Dental Instruments and Appliances would respectfully submit the following report:

1st. Improvement in dental chairs, by Dr. J. B. Morrison, of St. Louis. This admirable chair was presented to this Association during the session of 1868, and is described in the report of the committee at that time.

2nd. Improvement in dental chairs, by Dr. O. C. White, of Hopkinton, Mass.; also, models of his former invention, with improved self-attaching head rest. This invention is practical, and admirably adapted to the purpose for which it is intended.

3rd. M. M. Johnston & Co., manufacturers, presented an improvement in the coating of dental instruments with pure nickel, to prevent oxidation when exposed to moisture or corrosive gases. It is also claimed that it is especially adapted for the use of the dental profession on account of its extreme hardness, and its freedom from change by blackening when brought in contact with sulphur or any of its gases, as is the case with silver. Nickel makes a beautiful coating, and wears longer than any material before used for this purpose.

4th. Dr. J. B. Adams, of Worcester, Mass., exhibited an instrument for more rapidly and perfectly rolling or preparing gold foil for filling teeth. It is well adapted to its purpose.

5th. Dr. J. B. Coolidge, of Boston, exhibited an instrument for the careful regulation of heat in the manufacture of nitrous oxide when common burning gas is used. Its simplicity and perfection in operation recommend it to the profession. The Dr. also presents an instrument to facilitate the application of the rubber dam. It is simple and effective in operation.

6th. Dr. B. T. Whitney, of Buffalo, exhibited two forms of clamps and buttons to close the ducts of Steno; also, an improved adjustable compressor for the inferior maxillary, closing the submaxillary and sublingual ducts; also, a separating file-carrier, by which broken files may be used conveniently as before broken. They are attached to the carrier with gum shellac. These appliances are well adapted, and fill a want long felt by the profession.

7th. Dr. O. Willson, of Aurora, Illinois, exhibited a chloroform inhaler; also nitrous oxide inhaler.

8th. Dr. W. H. Jackson, of Ann Arbor, Mich., exhibited a pneumatic mallet for filling teeth, claiming it to be an instrument entirely under the control of the operator, producing less effect upon the soft tissues beyond the tooth than any other mallet, for the same amount of condensation, by at least one-half, therefore being less liable to produce periostitis or tenderness from long operations. It can be used by hand pressure, as the point rests in a stationary socket. By the rapidity of the blow, gold can be condensed in less than one-half the time used by other methods. It can be used in all places where the common mallet plugger can be used. There are no valves about it to get out of order. It is operated by the foot, the connection between the foot and hand being made by a rubber tube; the power of the blow being in proportion to the rapidity of the stroke, it being perfectly governed by the operator.

9th. Dr. A. W. Sprague, of Boston, exhibited an improved heater and automatic regulator, where kerosene oil is used as a heating agent in the manufacture of nitrous oxide. By means of a column of water acting on a float, the flame and regulation of the heat of nitrate of ammonia are accurately maintained, without the trouble of watching. Also, presented another burner for regulating common burning gas.

10th. S. S. White presented some beautiful burs for opening cavities; they are cut coarse, and sharpened with a stone; they cut fast, and can be re-sharpened. Also, some specimens of artificial teeth, beautiful in adaptation and expression, and proportion of upper and lower sets—finest specimens we have seen.

11th. The claims made by Dr. Willson, for his nitrous oxide gas inhaler, are—1st. Perfection of mechanical arrangement in the simplest form, with the least liability to become disarranged. 2nd. Its better adaptation to the purposes of an inhaler, in that it secures the very best control of the nitrous oxide and of the atmospheric air, either of which can be admitted at will, without removing the inhaler, and unconsciously to the patient, by the mere motion of the finger of the operator. 3rd. For the chloroform or ether inhaler it is claimed that what has been sought by so many in the past—a means of mingling, in well defined proportions, atmospheric air and the vapor of ether or chloroform, as securing greater safety in the use of these agents—has, by means of this inhaler, been secured, an absolute measurement being attainable, it is claimed, through the arrangement of this appliance.

FRANK ABBOTT,
CORYDON PALMER,
Committee.

REPORT
OF
COMMITTEE ON PRIZE ESSAYS.

G. H. CUSHING, CHAIRMAN.

The Committee on Prize Essays beg leave, respectfully, to submit the following report:

No essays have been placed in their hands for examination, nor, so far as they are aware, have any been prepared with a view to be presented as prize essays.

DISCUSSIONS.

Reported by W. C. HORNE, D. D. S.

DENTAL PATHOLOGY AND SURGERY.

Dr. Atkinson said: The reason that more is not known on this subject is because of the general belief that there is no money to be got out of it, and this idea necessarily closes the field of vision beyond. The majority of our superior men have obtained their knowledge through long and earnest efforts. If I could supply the lost brick in every man's pathology, I should be very happy to do it. In the matter of operations of a surgical nature, the dental practitioner can put to shame the general surgeon, from his greater experience with, and familiarity in, the use of his instruments. Dental pathology is much more clearly defined than general, because of its limited range and the uncomplicated character of the structures; hence, more definite and understandable by less erudite minds. In enamel we find the exact analogue of the mineral kingdom, whose mode of aggregation is an expression of the laws of crystallography; and in the dentine, that of the vegetable kingdom, where nutrition is conducted by a to-and-fro movement of fluids in tubes; and in the pulp we have the exact and veritable mode of nutrition known to the animal kingdom, which is actuated by anatomical elements called cells. It is indispensable that it should be first known what *nutrition* means, and that all the tissues work up through their various grades by the formation, from an amorphous mass of chaotic substance, of the anatomical elements distinctive of the tissues. In the mineral kingdom we have the law of crystallography displayed in simplest and most composite expression. In the vegetable kingdom this is repeated, with an additional

complication and correlation of elements, so that a vegetable is but an advanced mineral, with the plus something that constitutes it a vegetable. In like manner the animal kingdom grows out of the vegetable by the process of disintegration and reconstruction on a higher plane; so that a complete understanding of animal nutrition involves both vegetable and mineral modes of destructive and constructive assimilation; and happy for us is it that the field of our labors is thus circumscribed, and that nature has preserved in the enamel the reminiscence of minerals, and in the dentine that of vegetables, which tolerates interference to such marvelous extent as to kindly submit to the removal of their sickened molecules, and admit of their substitution by foreign substance.

The knowledge of these principles has grown so insidiously upon us as to extend the field of study necessary to make diagnosticians, so that to-day almost the most ignorant know more than the fathers of thirty years ago. To be respectably successful to-day, we must be able to master and control the whole field, in diagnosis and in execution of the redemptive procedure in pathological and surgical cases. The principal reason why we of to-day know more than our fathers, is the result of the labors of a single man, some two centuries since, who penetrated the field of organology to a depth before unknown, unsuspected, and unlooked for. I refer to the renowned Leeuwenhoek, the inventor of the microscope. Important as was this discovery, it took a century and a half for learned men to acknowledge and appropriate it; and the necessity is upon us now to review by the light of this discovery the works of the best laborers in this field, to eliminate error, and demonstrate true positions. The living economy, from lowest crystal to highest mammal, selects and appropriates, from merest pabulum, that of which it stands in need, wisely adjusting each elemental body in the proper relation to its fellows, to construct the harmonious whole of simplest or most complex body, and this is the measure of the physiology of the organic world. In the human organization, the culmination of mind and matter, anything that can exert an influence upon us may

tend to continue this harmonious functional action, or be the point of inception of inharmony, thus inaugurating pathological states. Thinking, in a continuous unintermitted effort, may so derange the nutrition of certain territories as to result in disease; but so few men are capable of thinking, and the many are so ready to accept at second-hand and adopt the thoughts of others, that we need not very much distress ourselves with the fear of pathological action from this cause. Irregular breathing has its effect upon all the other functions of the body, by arresting the regular gyrations of circulation and digestion that take their origin in the respiratory function. Sudden arrest of mental attention and intense concentration of this same effort are capable of producing this effect of stoppage of respiration for the time, until the mental tension is changed so as to permit the respiratory function to resume its sway. I merely mention these to show how important it is for us to remember how our life is but a vapor, capable of being dissipated by apparently insignificant causes. Imperfect bodies are alone amenable to pathological action, perfect bodies having no foreign affinities. Wherever the enamel is imperfectly formed at the junction of the denticles that constitute the tooth, and leaves open fissures at these locations, I would advise the removal of all the imperfect portion, and even some of that that is well formed, if necessary, to secure a good cavity in which to impact the gold, the form of which I would prefer to be heavy foil—Nos. 8, 10, 15, and 20. It is fashionable to fill with gold now, but the material is not so important as the manner of using it. Any indestructible matter that agrees with the ghost or typal form of the tooth, properly used, should preserve it indefinitely. I have never filled teeth so satisfactorily to myself as in 1869, because the range of my perception is larger, and the means more extended and more readily obtained; the principal of which is heavy foil, and the lead mallet, ranging from four to twelve ounces in weight. We often hear one dentist complain of the work of another; but no one is clear in this matter so long as he has the painful or pleasing recollection of the like ignorance of which he complains in

another. We are all making advances, and elevate our standard as we advance; hence that which was once excellence is now inexcusable blundering; but many have the happy faculty of forgetting that they ever blundered or fell short of their high present standard. The daily prayer of my life is that I may be able to do no more mischief, do all the good possible, and be the highest expression of dental knowledge and skill on the planet; and I would to God that every one in this presence would heartily and honestly make the same prayer.

There is no pure expression of physiology on the planet except in the mineral kingdom. All former definitions of a cell are a *sell.* The same productive process obtains in a nucleus as in a cell; that which is necessary to a nucleus, or a nucleolus, or any other body capable of being seen, or the unseen elements out of which these are composed, and are capable of conception, but not of perception, are all endowed with three essential elements,—centre, surface, substance. The machinery of sense can only produce an image or impression which is capable of being perceived by the sentiency which is behind all this machinery.

Dr. Buckingham. What is a nucleated cell? Describe it.

Dr. Atkinson. A nucleated cell, to be understood, must be compared with non-nucleated and other cells of varied constitution. Simple cells, in general, are said to be made of cell-wall and parenchyma, or inclosed substance, and are the examples of non-nucleated cells. A nucleated cell is the same cell with a central portion of its parenchyma so concentrated as to diffract or reflect some portion of the light pencil, thus making it visible as a darker spot. Multiplied dark points constitute the many-nucleated cells. If we wish to clearly understand what is meant by the nomenclature of the books discussing cellular pathology, we must study each author by himself, for there is no settled agreement as to what shall constitute a correct nomenclature. A molecule is an ideal body; a granule is an aggregation of unknown chiliads of these, and thus becomes a perceptible body, capable of casting its shadow or image upon the retina; itself made up of like constituents,

with a similarity of tension, of force and form, the essential requisite of sight. The desire to know, and the attainment of knowledge, hold a relation to each other; but the desire to attain, and the ability to communicate, are not father and son, but great-grandfather and great-grandchild. Hence, the greatest novice may puzzle the greatest philosopher to satisfactorily answer, to his apprehension, the queries he may put forth with almost spontaneous effort. The difference between minds is but one of degree, for all have to be developed from out of the dark ocean of non knowledge. Probably there is no one in this presence that is not the superior of all the others in some of the ripening stages of matter and mind—the correlative necessities of substance in human beings. So let us apply ourselves with all our might to essay the solution of every query that can by possibility arise; esteeming the query itself as the proof and the prophecy of its solution to full satisfaction, on the plane in which it makes itself heard to the mind that propounds it. Molecules, then, may be said to be the result of the tendency to the centre of infinitessimal atoms; while granules are the combination of these at the centre, with a tendency from the centre; thus we have the first letter in our alphabet, of form and function necessary to the nutrition of any body. To bring this within the range of our senses, we must accept this supersensuous process. All this is capable of being brought within the purview of conception and perception, the dual primates of sense. Opacity stands in the way of pursuing the alternations of generations of cells in the production of tissues in the human body; but in the transparent bodies of young fishes, reptiles, and fowls there is enough apparent to sight to suggest and establish the rôle of the elements of the organs of even the highest bodies. Most of that which we have already attained in this direction we owe to our transatlantic brethren. We, as Americans, need more of the German persistency of mind that pursues the discovery and proof of a single point in biology during a long and laborious life, and less of the diffuseness of the *omnium gatherum* character of the American type of pathologists.

In consequence of a very little study in this direction, I am no

longer able conscientiously to destroy the pulps of teeth under any circumstances; and, in testimony of the confidence with which I rely upon the doctrines here enunciated, I will detail a case which occurred last Friday. Female subject; superior canine tooth, exposed pulp; bled; touched with creasote, which arrested bleeding; filled with oxychloride of zinc; proceeded to work in another direction till the filling had set; then cut away oxychloride, leaving sufficient for a cap, and filled with gold; and if it is not a success I shall be very much disappointed.

Dr. Buckingham. What takes place between the oxychloride and the pulp?

Dr. Atkinson. There is an affinity between the hydrochlorate of zinc (the fluid used with the oxide of zinc) and the albuminoid substance of the pulp, and at the point where the satisfaction is complete of this affinity an insoluble pellicle is formed. Beyond this, on the inner side, the coagulation is less and less, becoming simply astringent, collapsing the capillaries, driving the blood column—blood corpuscles and all—into the venous radicles, until the recoil of the column by the *vis-à-tergo* of the circulation re-opens the arterial radicles and the capillary system, re-establishing healthy circulation, without the possibility of setting up the inflammatory process, or inducing the exudation of a single pus corpuscle. In case of a very weak pulp. and strong and abundant solution of the hydrochlorate, the coagulation may be effected to the foramen.

Dr. Buckingham. Is there any pain during any part of the operation when the pulp is in a normal condition?

Dr. Atkinson. Exposure itself is an abnormal state; but I have no pain manifested by my patients nor the patients of those who have faithfully followed my directions, as far as reported to me, and I have had many of these. The reason of there being no pain is the free use of creasote. I never purposely destroy a pulp, and that dentist is weak or wicked who would do so.

Dr. Bogue. How would you preserve a pulp that is exposed and partly suppurated?

Dr. Atkinson. That question can best be answered by

detailing my procedure in just such a case. A portion of the pulp had sloughed away. I resorted to my usual treatment in such cases, sopping the pulp with creasote, and covering with cotton and sandarac varnish; this dressing was continued for three weeks; at the end of that time the whole of the body of the pulp was converted into a mass of carbolate of albumen, and came away upon taking hold of it, leaving the legs in the roots in healthy and sensitive condition. Six other pulps in similar condition in the same mouth were treated in the same manner without appreciable loss of substance. I am down on the death penalty; as long as there is life there is hope. Every man in dentistry should bring all his best powers into exercise in the practice of his profession, or he is a sinner.

A Member. Does the application of creasote tend to lessen the vitality of the pulp?

Dr. Atkinson. Creasote destroys the periphery, which must be thrown off; and a pulp may be thus destroyed by continued applications. Iodine has such an affinity for some tissues as to stimulate some and destroy others, according to the amount of vigor they possess; the sick being killed and the weak being restored.

A Member. Has not the liquid part of the oxychloride of zinc the same action as the creasote?

Dr. Atkinson. I have never known a case of even a similar action; identity of result is an impossibility, because each exerts its own specific function according to its nature. That they each coagulate albumen is certain.

Dr. Wetherbee. Is it not true that if the oxychloride of zinc is used, without any excess of the fluid, the same result may be obtained without creasote as with it?

Dr. Atkinson. That depends upon the temperament; in low organization such a result might be attained. I always use creasote with it.

Dr. Wetherbee. When I find an exposed pulp which has not bled, I apply the oxychloride directly to it, only using creasote when the pulp is exposed and bled by the instrument (as will sometimes happen even to the most skillful operator), and that merely as an astringent. If the chloride of zinc, in

coming in contact with the pulp, produces the same result as the creasote, why should the latter be used, unless it is preventive of pain? Is it true that the occurrence of pain endangers the life of the pulp? I believe not; and whether I apply the creasote or the oxychloride directly to the pulp, there is commonly a twinge of pain, which soon passes away and is followed by no ill results. In those families which have been long under my charge, and where the teeth are inspected at regular intervals, I do not have occasion to perform any operations of this character; they are confined in the main to new patients. During the past year I have found no case of death of a pulp treated by me in the manner described. When first I commenced this method, it was with hesitancy and misgiving; but it proved so satisfactory that I have gone on, and now believe that, whatever the pathological conditions, they can be conquered. And here comes a wail from some one who has been unsuccessful; but I would say to that man, The fault is your own. I account for this unsuccess by supposing that the mixture was too hard when applied to the pulp, or that the cap was broken in inserting the gold filling. Such failures should not be charged upon the material which proves so successful in abler hands.

Dr. Buckingham said he had tried to follow out all the directions given with the greatest care, but had not had uniform results. No surgeon could prognosticate how any case would turn out; no more could any dentist. He took exceptions to Dr. Atkinson's view of the condition of the pulp as acted upon by creasote. After sloughing and the application of creasote there must be a cicatrix formed; the pulp must have a natural covering; it cannot tolerate the presence of a foreign substance without some degree of inflammation, which was likely at any time to be waked up into an active state.

Dr. Atkinson. There is no cicatrix; merely a new coagulum is formed; a pellicle, taking the place of the natural covering, dentine.

Dr. Buckingham. You cannot form a coagulum which will not allow fluids to pass through it; even if it were as thick as leather, fluids would pass through it. In this way I have

lost a number of cases, and therefore cannot report uniform success.

Dr. Wetherbee. Suppose there is an exudation from the pulp, is there no provision for taking it up? The oxychloride of zinc is porous; the best ever made will absorb moisture, and for that reason it is the best material for capping tooth pulps. It will absorb *liguor sanguinis*, or anything else, from the pulp which comes in contact with it. It is sufficiently normal to insure success; and I believe 100 per cent. of cases would succeed, if the cap were not broken.

A Member. Do you admit that, if there is partial suppuration, the rest of the pulp may have recuperative power?

Dr. Wetherbee. I have never known a suppurating pulp to be saved; and do not recommend that style of practice. There are three classes of exposed pulps which are amenable to treatment. The first, where there is simple exposure; to these I apply the oxychloride, pure and simple. The second, where the pulp is exposed and wounded so as to bleed; here I apply creasote as an astringent and hæmostatic, followed by the oxychloride. The third, where the pulp is congested and has given considerable pain; here I use means to reduce the congestion, and then fill as before, with confidence of success.

Dr. Butler. Do you still think that it is injurious to the pulp to fill the whole of a large cavity with the oxychloride?

Dr. Wetherbee, in reply, mentioned a case which had come under his care, where the pulps, not being exposed, a former operator had filled the cavities entirely with oxychloride, and these fillings had been renewed at times for three years; when he (Dr. W.) examined them the pulps were found dead, and he attributed this to the continued action of an excess of the hydrochlorate. When oxychloride is only used in filling, its porosity is an objection; its external surface is acted upon by the fluids of the mouth. Especially in those which have an acid reaction, disintegration immediately follows. Moreover, there is greater danger from an excess of the hydrochlorate then when a much less quantity is used.

Dr. Butler thought Dr. Wetherbee's position questionable. How could it be known just how much of the material to use,

if such different results followed? He had used the oxychloride both as a cap and for an entire filling, and had found it to serve equally well.

Dr. Pierce said he should have to be considered one of those whom a previous speaker had stigmatized as "weak and wicked." Not that he failed to fully recognize the importance of preserving the vitality of the pulp, and would not gladly accept as a valuable acquisition to operative dentistry any method that had that end in view; but he felt that the result, so far as his limited experience had gone, would not justify the indiscriminate use of oxychloride for that purpose. Its advocates claim that pulps, healthy or diseased, of recent or remote exposure, can alike be saved, provided creasote be applied previously to filling. It has also been asserted that the operation was attended with little or no pain. He was satisfied that even with the most delicate manipulation, pain severe and persistent would often accompany the operation, and that though pulps doubtless, in many cases, retain their vitality, yet others that he had had the opportunity of examining were dead, though not offensive,—the latter condition due, he thought, to the antiseptic properties of the chloride of zinc.

The practice of capping pulps with materials such as lead, tin, horn asbestos, Hill's stopping, gutta percha, collodion, etc., etc., had all been used with various results, and each in turn had been thought to be the peculiar and favored article. And all these changes have been not without cause. For, while in some peculiar constitutions and habits of life, an operation, though careless and unskilled, would produce a favorable result; in others, the most delicate and skillful manipulation would prove a failure. And now, oxychloride promises to supersede all the others; and though its advocates are many, and the array of cases formidable, yet the time is too short and the failures too frequent, to claim that all is gained, and the victory won. With this feeling of uncertainty and desire for success, there are many cases where he would prefer to *devitalize* the pulp, while those presenting favorable indications were transferred to his associate, who had more experience in its manipulation, and faith in its success.

Dr. Bogue thought cutting into teeth to test their vitality, mere boy's play. A spicule of ice applied to the tooth was always a satisfactory test of its condition. Where suppuration of the pulp had far advanced, he did not believe it was amenable to treatment. He kept exceedingly careful records of every case of pulp exposure treated by him, and had not lost one case of a healthy pulp, using the same means as described by the previous speakers. He had not yet learned how to arrest inflammatory action in the pulp, and would gladly receive instruction on that point from any one who was capable of imparting it.

Dr. McClelland believed erroneous views were entertained concerning the therapeutic action of the oxychloride of zinc. With a healthy pulp, its therapeutic properties amount to nothing; its only value was in its adaptability; gutta percha would be just as useful, if it were as easy of manipulation.

Dr. Truman said: The success of this use of the oxychloride of zinc must necessarily overthrow the practice of twenty years; and I am not prepared, from anything I have seen or heard, to assert that the filling of roots is a failure. All know that the removal of the pulp is a success, just as far as amputation in surgery is a success, because it is the best thing to be done under certain circumstances. The subject has been treated vaguely by individuals, who asserted dogmatically, without producing facts in support. One asserts that there can be no failure; another admits some; while a third finds the failures to outbalance the successes. There must be a level of truth somewhere; but at this stage we can take nothing about it to be settled; it would require years of observation and experience to arrive at any positive conclusions. The theory of capping, which has been tried for years, is now an acknowledged failure. I have tried the oxychloride for two years faithfully, and believe in it. I have had failures, and thought every one must have them. Certain conditions admit of its use. I have never yet found a pulp dead from its use; but it is impossible to tell what the result may be; and I do not believe that ill success can always be charged to malpractice. It may be that there is something in its antiseptic proper-

ties which will preserve the appearance of the tooth after the pulp is dead; but no one can tell what is its mode of operation. These questions should all be studied out at home, and we should not come here to propound theories without an array of well-digested facts to sustain them. American dentists are very far in the rear in their theoretical knowledge; as far behind the Europeans in this department as the latter are behind the Americans in practical skill.

Dr. Searle said, that he had had opportunity, during the year, of examining two teeth, filled in 1862 and 1863, of which records had been kept. In that of 1863, superior second bicuspid, the pulp bled, was capped with oxychloride, and filled with gold. In 1869 that filling had been removed; the pulp was found to be living and healthy. This tooth was removed on account of neuralgia. In that of 1862, an inferior first molar, the tooth had ached; it was filled as before. The pain was intolerable for two or three hours, then ceased; there was no subsequent return of pain, nor any discoloration. This tooth had also been removed, and, on opening it, the entire pulp was found to have dried up and disappeared; there was no fetor. In other cases inflammation had followed, generally in a very few days; where it goes on for a number of days without pain, he feels no apprehension, the tooth generally dying quietly, without discoloration.

Dr. Judd said: The question to be discussed is not, whether the practice of capping pulps is always successful, but whether it be a judicious practice, or not. We amputate limbs, and it is universally conceded that, under certain circumstances, it is a judicious practice; though it is not unfrequently attended by fatal consequences. So this practice may be a judicious practice, even if it sometimes fails to preserve the pulp alive. Is a tooth with a live pulp better than one with a dead pulp? Physiologically considered, we can scarcely fail to arrive at the conclusion that the tooth with a living pulp is much better calculated to withstand the changing circumstances and conditions to which it will be almost daily subjected, than one from which so much of the vital forces must necessarily be withdrawn, as is the case when the principal nutritive support is cut off by a

destruction of the pulp, with all of its vascular and nervous supplies. We must remember that in the normal condition nutritive changes go on at all times in the teeth, even in the enamel itself. It is true that some have not yet subscribed to this doctrine; but it must be borne in mind that the enamel, dentine and cementum are all made up of hard and soft substances; and no one will deny that all soft tissues change. Take the case of a tooth, the pulp canal of which had been filled; it remained quiet for years, but the patient, having an attack of measles, an abscess formed. This shows the necessity of the pulp to preserve the tooth under unfavorable circumstances. I consider it of the first importance, then, to save pulps alive; in many cases they do live under the oxychloride, and likewise die, and so also with gold. Many times teeth filled with gold, the pulps of which were never uncovered, die. I am not prepared to say under which circumstances most dead pulps are to be found; it is certain they are to be found under both. It is always time enough to kill a pulp, but, once dead, it can never be brought to life again; it is, therefore, a judicious practice to preserve all, if possible, alive.

Pathology is a complicated and unknown subject; less is known of it than of any other in the broad domain of medicine. A few isolated facts and a vast number of theories are all that we have to show of it. The very first step, etiology, puts us at fault; we know so little definitely of the causes of disease. I am unable to give a definition of what a cell is, though Dr. Atkinson undertook to explain it. The general idea of a cell is that it is a small body with a cell-wall, fluid contents, and a nucleus; that each cell lives by itself, and has an influence on its neighbors. It is the opinion of Virchow that each cell dominates a certain territory around it. If this definition of a cell be correct, the idea that it is the ultimate anatomical element, which is capable of exhibiting the phenomena of life, is inadmissible. It has been settled by the observations of Agassiz and Beale that there are lower elements than cells capable of performing the functions of development. The ova of turtles are innumerable, and so small that they appear, under a magnifying power of 17,000 diameters, to be mere homogeneous

particles of germinal matter, yet they are capable of true growth. We must not then accord to the cell the honor of being the germinal particle.

The most generally accepted idea of the day, as to diseases, is that they are due to microscopic animals and plants, developed in living tissues. My attention has been especially called to this subject by a paper which accidentally came into my hands from Italy; in which the author claimed the discovery of the cholera plant in the mucous membrane of the intestines of the deceased, which he believed to be the efficient cause of Asiatic cholera. Salsbury took up a similar doctrine. Polly gives much attention to the discovery of agents to destroy these growths,—sulphurous acid being found the most deadly to them. Dr. Trueman takes the same view of the origin of the green stain on the teeth; we know that this destroys the texture of the tooth, while tartar protects the structure.

It is not unusual to find a condition of very high sensibility in a part of the dentine of a tooth, and very near it a tract almost or quite free from sensibility; and the question has often recurred to my mind how to account for it. I have made a great many sections for the purpose of determining this point; in many cases tracts were found in which the dentinal tubes were entirely wanting, the whole structure consisting of calcified matter as far as the tract extended. In one case, two entire quarters of the section were found destitute of nerve tubules, while the other portion was plentifully supplied with them. This condition affords the most satisfactory elucidation to my mind of the absence of sensibility in some portions of a tooth, and its presence in others, showing it to depend on the nerve filaments in the dentinal tubes.

Dr. McDonnell. In all modes of treatment success is variable, because the conditions are variable. I have capped teeth by different methods, and on opening them, years after, have found the pulps dead, without showing any outward signs of change. During the past year, I have capped twenty exposed pulps in the method described by the previous speakers; one of these I know to be dead. In making the application, I find that the degree of pain is regulated by the condition of the

pulp; when freshly exposed, the pain is very slight, but it is greater and longer continued in accordance with the amount of congestion. While I am a great advocate for saving teeth, I do not think that anybody can be always successful; much must depend on the condition of the patient. If the exposed pulp is healthy, not one in fifty need be destroyed; it is better to adopt the oxychloride process, and then, even if they do die, there will probably be no pain nor discoloration of the teeth. Where, from the general diseased condition of the pulp, I consider a cure impossible, I remove it; but believe more suffering is generally caused in extirpation than in applying oxychloride.

Dr. Searle inquired whether the application of either creasote or oxychloride to the pulp is not similar in effect, and whether they are compatible with it.

Dr. Atkinson said: Anything which contracts the tissues is an astringent, and this is the effect of creasote; it makes a solid mass of the coagulable portion of the pulp with which it comes in contact; the excess acting as a stimulant on the capillaries until its power is exhausted. Exactly the same thing occurs with the hydrochloride (not oxychloride) of zinc; they are similar in effect, and their mode of action is the same. Any agent which effects coagulation deprives the tissue of the power of forming globules of pus.

Dr. Buckingham. When the albumen is coagulated, will it ever become soluble again?

Dr. Atkinson. Yes, and no,—dependent on the extent of the coagulation. The territory in which nutrient action takes place is always a collagenic or mucoid mass, whether that be in the general juices of the flesh, or the sarcode, in the anatomical elements denominated cells, where function is more differentially elaborated. We only know a tissue by its anatomical elements, and this difference is that which constitutes the character of the cells. In a general way, teeth may be said to be osseous tissues; but that is too crude a definition to be of service to the histologist, physiologist, or pathologist. There are three forms of hard dental tissue, known by the character of their cells, viz.: enamel, dentine, and cementum, and they are

but difference of degree of calcification, under the dominion of typal presence. The last of these is so nearly like the bone cell as to be readily mistaken for it upon superficial examination. The formation of cells is always uniform in each kind. There is no physical distinction between a cell-wall and its contents; it appears to be a homogeneous mass,—and there is no cell with fluid contents.

Dr. Judd. I will repeat that I have seen but one instance in which two full quarters of a horizontal section were made of calcified tracts, in which the tubules were entirely wanting, and this was a very uncommon condition, though small tracts of the same character are commonly found. Dr. Atkinson thinks that the dentinal fibrils are mere extensions of nervous matter; I believe that within the tubules are true nerve filaments. The first layers of cells forming the exterior portion of the pulp, called "germinal matter" by Beale, penetrate the tubules, forming the soft fibres of Tomes. It must be borne in mind that Beale's investigations, to which we have referred, were made long after those of Tomes, and with vastly higher powers of observation. Beale saw that the terminal point of the nerve fibre, as described by his predecessors, was really not a terminal point, but only the point where it breaks up into an infinite number of fibrils in the germinal matter of the pulp. Now, there is room in the dentinal tubules for whole plexuses of these minute fibrils, and it is reasonable to suppose that they enter the tubules in common with the germinal matter—the tubules measuring $\frac{1}{1000}$ of an inch, while these minute nerve filaments are but the $\frac{1}{10000}$. Further than this, Beale has enunciated the doctrine that there are no terminations to the nerve fibrils, but that, like the electric conductors of the telegraph, their circuit is continuous, so that there is no break in their attachment to the nervous centres. It is a principle of the Baconian philosophy that it is unphilosophical to make use of hypothesis to explain any given phenomena which can be explained by the operation of known laws; and in this case, I think this principle is applicable, and I accept the facts developed by the advance of scientific investigation as a far more satisfactory elucidation of the

question of sensibility in dentine than any of the fanciful theories which have been proposed.

Dr. McQuillen said: Regarding those present as representative men, understanding scientific principles, and familiar with elementary knowledge, I shall not address them as students just entering upon the consideration of such matters; but paying a decent respect to the intelligence and acquirements of my auditory, I would present what I have to offer as to those qualified to have views and opinions of their own. I differ, in some respects, from the opinions advanced by Dr. Judd in relation to the character of the dentinal fibrils. Tomes directed attention to the fact that the dentinal tubules are occupied by fibrillæ, and Beale concurred in that view; while the former is disposed to regard them as nerve fibres, neither have *asserted* them to be such. Beale, indeed, has spoken of them as *germinal matter*, from which the *formed material* or completed tissue is made. I have seen these fibres in examining pulps, but am disposed to think they are fluid rather than solid during life, and that their solidity under the microscope follows the removal of the tooth like the change in the blood by coagulation. We have liquor sanguinis present in the pulp, and therefore the analogy might hold. I advance this view suggestively, as it is impossible to demonstrate the fluidity or solidity of the contents of the tubuli during life, because the structure can only be examined post-mortem. Ten years ago, in making an examination of the pulps of the incisors of a calf, I found no well-marked connection between the pulp and the walls of the cavity in which it was lodged, except at the end of the root, where the organic basis of the dentine had been formed, with a very slight deposit of the inorganic constituents. On making a longitudinal section of the tooth, the pulp could be drawn out of the cavity without any force being exerted. Indeed, the weight of the pulp was sufficient to dislodge it when the divided tooth was held in such a position as to favor it. The connection at the end of the root, however, was invariably so firm as to require considerable force to sever it. Within the past two months, in making some injections of the pulps of calves' teeth, I obtained similar results to those

just described, and it induces me now, as formerly, to question—if the dentinal fibrillæ, which I have observed projecting from these pulps, are really extensions of the pulps—how the latter can so readily part from the walls of the pulp cavity, where it would be right to infer they were so firmly secured. Gulliver could not have been more firmly fastened to the ground when each hair of his head was tied by the Lilliputians, than a pulp would be to the walls of a pulp-cavity if solid fibrillæ passed directly from it into each tubule.

In stating these views, I merely offer them for what they are worth, and with a full recognition of the fact that, one has no right, except inferentially, to draw deductions from observations on animals and apply them to man. I will, therefore, direct attention to the ease with which the pulps of human teeth can be removed with a barbed probe; an incomprehensible operation, if the supposed connection really exists. Let any one attempt to remove the periosteum from sound bone where direct connection exists, and find the character of the adhesion.

But we are met with the inquiry, Can any other than nerve substance transmit impressions through the tooth? I can see no reason why it might not. The air transmits sound, by waves of vibration, and if one end of a long stick be placed near the ear, and the other end be scratched by a pin, the sound will be transmitted along the stick to the ear; and sensations, in a similar manner, may be transmitted through the tooth to an impressible pulp.

As to the advisability of using oxychloride of zinc, I believe in trying whether a thing is good or bad. I have tried this preparation on exposed pulps in a number of cases—in two instances in particular, which I have watched. After a month, the teeth were in a comfortable condition, and possessed evidences of vitality in color, sensation, etc. What the future results will be, time alone can reveal.

Dr. Truman said, that when Tomes made his first statement in regard to nerve fibres, ten years ago, investigations had not been carried to their present degree. The method he had pursued was extremely imperfect. Beale indorses Tomes' view, but calls the tubular contents germinal matter, and proves

his position by the experiment with carmine. Since Beale, Balle, of Germany, has written a monograph upon the same subject, in which he takes the same position as to the nerve fibres, and proves it by experiments on the rodents. In this country similar experiments had been made. He was not prepared to admit the correctness of Dr. McQuillen's position. The best method of observing these fibrils is to prepare a section of a fresh tooth, and treat it with hydrochloric acid; this will remove the animal matter, and bring out the fibres on the slide by thousands. As they present the peculiar varicose appearance of nerve fibres, he was satisfied that they were such.

Dr. Buckingham. Is it necessary that a nerve fibre should be touched, to cause sensation? It is not necessary. I favor the idea that the action in the cells is similar to the action in the galvanic battery,—the wires representing the nerves. There is great similarity between chemical and physiological action. Where does the nerve fibre terminate? There is no necessity of its going to each cell, but only in its neighborhood; and the impression may be conveyed to any part.

Dr. Shadoan said, that in case of exposure, and the pulp membrane being wounded, his practice is very much like that of those who had spoken before him, with this difference,—he applies creasote or carbolic acid until the hemorrhage has entirely ceased, then dries out the cavity thoroughly, and with a blunt-pointed instrument, of suitable size and shape, applies a single drop of collodion to the point of exposure, allowing the ether to evaporate; then, on applying the oxychloride of zinc, there is perfect protection to the nerve.

If the nerve is exposed, and not wounded, the application of the collodion will form an admirable protection from the immediate contact of the oxychloride. He has found that, where this precaution is used, the pain is seldom appreciable, and often there is none at all. There is something in the manner of applying the paste. He had found that the softer it is, the more pain and the less dense the mass when hard; and the harder the paste, so it is plastic enough for use, the harder it will become. There is no better way to apply it than by

having all things ready to manipulate, and, having an instrument wound with a little cotton, dip it into a very thin solution of the fluid, and mop or wipe out the surface of the cavity, and apply the paste; then gently tap the tooth, and the paste will settle nicely and uniformly to the bottom of the cavity. If the paste proves rather soft after applying it, the excess of fluid may be taken up very readily by pressing some spunk or bibulous paper upon the surface. Oxychloride of zinc is valuable in filling the pulp chambers of teeth where the roots have been filled. It makes a firm foundation for the filling, and arrests thermal shocks, which are sometimes troublesome where the gold is continuous from the crown to the apex of the root.

DENTAL CHEMISTRY.

Dr. Buckingham said, in the absence of any report from the Committee on Dental Chemistry, he had been requested to make some remarks on this subject. There had been little progress in dental chemistry during the past year, and he would, therefore, confine himself rather to a statement of the direction of inquiry among investigators in the department of chemical science. He considered it to be a subject of most serious regret that this science, which lay at the foundation of all others, was so universally neglected by the community. The ignorance upon this subject was most deplorable. How many students or learned men could tell the constituents of the air they breathe, the water they drink, or the bread they eat! Not one in five hundred of them could tell how many elements there are; so that professors are obliged to teach the A B C of the science, instead of finding students ready to be instructed in the higher branches. As in reading it is necessary, first, to master the letters and their capabilities of combination, so it is in chemistry. The elements, sixty-five to seventy in number, with their equivalents and atomic weights, are the alphabet of the

science from which all chemical combinations arise; the properties of the individual element being lost in the combination, just as in words the essential part is not found in the separate letters, but in the thought suggested by the whole.

The investigations of the present are directed, not to matter so much as to the forces which control matter. The great question is, whether there is one force or many. Whether heat, electricity, motion, etc., are several forces, or phases of one force. Motion produces sound, which is conveyed to the ear—hence, hearing; a faster motion produces heat; another motion produces light, the varieties of color being due to the different degrees of rapidity of the motion. These views have not been demonstrated, but the current of opinion is in favor of their correctness. The whole universe is in continual motion; harmonious motion is necessary to nutrition and health, and the disturbance of that harmony produces pain; thus extreme heat or cold produces the same effect. While the elements cannot be changed, their combinations are illimitable; and living bodies are continually nourished by appropriating from these combinations, in the form of food, that which they require, passing off the refuse in lower states of combination. The speaker dwelt at some length on the important part chemistry performs in the physiology of life, and concluded by animadverting upon the sceptical tendencies of many modern scientific investigators, whose disposition seemed to be to set up some great natural force as the origin of all life and motion, whereas he believed all life-force to be subordinate to spirit-force, proceeding from the Almighty Creator.

Dr. Judd said, it was true more attention was being paid to the affections of matter than to matter itself. Although matter may be ignored in the study of the forces, it is, nevertheless, indispensable to their operation. It is impossible to have any notion of motion apart from matter. He proceeded to state the views of Tyndall and Grove on this subject, with the latter of whom he expressed his agreement.

Dr. Buckingham. We cannot understand the existence of a force without matter; neither can we conceive of motion without something to move. Hence scientific men invented

the idea of an ether, which should be the medium of conveying the idea of motion. The consideration of the origin of forces occasions the continual recurrence of the question : Are there many forces, or is there but one acting in different ways? When matter was made, the laws controlling it were made, and they must continue to the end of time. Man has no conception of sensation apart from matter, nor of the manner in which he reasons.

Dr. McQuillen said: I congratulate the Association on the fact, that although the Committee on Physiology has failed to make a report, the one on Chemistry supplies the deficiency by the introduction of such important questions as the Correlation of Forces and the Origin of Species. In the discussion of such subjects, they should be examined in the calm, dispassionate manner in which other purely scientific themes would be considered. Above all, it should be recognized that the right to seek after the truth, even though it should lead to a conflict with long-cherished opinions, is the highest prerogative of man. As Herbert Spencer has justly said, "Early ideas are not usually true ideas. Undeveloped intellect, be it that of an individual or that of the race, forms conclusions which require to be revised and re-revised, before they reach a tolerable correspondence with realities. Were it otherwise, there would be no discovery, no increase of intelligence. What we call the progress of knowledge is the bringing of thoughts into harmony with things, and it implies that the first thoughts are either wholly out of harmony with things, or in very incomplete harmony with them.

"If illustrations be needed, the history of every science furnishes them. The primitive notions of mankind as to the structure of the heavens were wrong; and the notions which replaced them were successively less wrong. The original belief respecting the form of the earth was wrong; and this wrong belief survived through the first civilizations. The earliest ideas that have come down to us concerning the natures of the elements were wrong; and only in quite recent times has the composition of matter in its various forms been better understood. The interpretation of mechanical facts, of meteor-

ological facts, of physiological facts, were at first wrong. In all these cases men set out with beliefs, which, if not absolutely false, contained but small amounts of truth, disguised by immense amounts of error.

"Hence the hypothesis that living beings resulted from special creations, being a primitive hypothesis, is probably an untrue hypothesis. If the interpretations of nature given by aboriginal men were erroneous in other directions, they were most likely erroneous in this direction. It would be strange if, while these aboriginal men failed to reach the truth in so many cases where it is comparatively conspicuous, they yet reached the truth in cases where it is comparatively hidden."

That mystery of mysteries, the Origin of Species, is occupying the undivided attention of some of the keenest and clearest intellects in the world. Darwin, in particular, a devoted student of nature, after years of labor spent in accumulating an immense mass of facts, has drawn certain inferences, which are entitled to a candid, careful examination before being rejected as unfounded and worthless. A significant fact, but not by any means a surprising one, is that most of those who oppose or denounce his views, have never read his works, and therefore know nothing of the facts and arguments presented in them. Thus it is ever with innovators and innovations. In the language of Agassiz, "It is said of all discoveries, first, it is not true; next, it is opposed to religion; lastly, everybody knew it was so."

The time is too limited to present even a faint synopsis of the Evolution theory, but it may not be amiss to say, in a few words, that Darwin has not attempted to solve the question of the origination of living or organic beings, but, supposing their creation to have taken place at first in the lowest forms, he accounts for the origin of species through the perpetuation and modification of the original types. First, by the possession of a peculiar property, which he calls Atavism, from *Atavus*, ancestor, living beings inherit the character of those from whom they arise. Second, there is also manifested a tendency to variability, due to the influence of the surrounding conditions of existence; and an alteration having occurred in certain

beings, it would be transmitted to their descendants. In the lapse of geological ages, the combined operation of these tendencies to the transmission of hereditary properties, and of occasional variability, due to the changing conditions of existence, combined with the struggle for existence between individuals of different species (in which those possessing the greater facilities for obtaining food, or of resisting external destructive agencies, would survive and multiply, while those less fortunate would gradually die out), Darwin believes may account for the infinite variety of species, extinct and present.

In presenting these views, I do not wish to be understood as asserting, beyond a question or doubt, that they are true; but that, after spending a number of years in examining the facts and arguments offered, the conclusions arrived at appear to me reasonable and logical inferences. It is sincerely to be hoped that those present may become thoroughly familiar with the writings of Herbert Spencer, Darwin, and Huxley, particularly before denouncing or rejecting the views advanced by them as unfounded and worthless. In this restless, inquiring age, it is useless to attempt to silence the outspoken words of earnest investigators by the mere dogmas of the past. On the contrary, we should hold ourselves ready to examine and receive new truths, and to abandon erroneous opinions, when convinced of their fallacy. In this connection, I am free to admit that the sharply-defined boundaries between inorganic and organic matter, and the vegetable and animal kingdoms, contended for in the past, have lost much of their significance to my mind, when viewed by the light of recent investigations and reflection.

The constant interchange between inorganic and organic matter, the dependence of the vegetable upon the mineral, and of the animal upon the vegetable, as a factor of organic matter; and the return of the elements entering into the composition of the vegetable and the animal to the source from whence they came, to be similarly used again and again, for all time to come, by other beings, tends to lessen the gap between the inorganic and organic, the vegetable and the animal, and leads to the recognition of the fact that "Nature is a unity in diver-

sity of phenomena; a harmony blending together all created things, however dissimilar in form and attributes; one great whole, animated by the breath of life."

Dr. Buckingham said: According to the materialistic doctrine, all animals are developed by continuous progression. from the primary cell through all the lower genera and species up to man, and materialists look for the development of a being of a still higher order. All things, according to them, are derived from combinations, without the intervention of any Supreme Power; as if there were nothing superior to the types or letters composing any printed matter. Even as the letters are of themselves expressionless, dependent entirely upon the thought breathed into their combinations, so the forms of nature are dependent upon the Supreme Mind for their principle of life. The tissues have been counterfeited in all respects, except that vitality cannot be imparted to them. The materialists make no calculation upon a future existence; all their theories are limited to the development of the highest order of natural existence; beyond this they know nothing and admit nothing.

Dr. McQuillen said: Herbert Spencer has divided his "First Principles" into the unknowable and the laws of the knowable; under the first defining the province, limits, and relations of religion and science; and, under the second, unfolding those fundamental principles that have been arrived at within the sphere of the knowable; which are true of orders of phenomena, and constitute the foundation of all philosophy; and maintaining the law of evolution to be universal in its operations.

In the discussion of all scientific subjects, and particularly those under consideration, it would be well to recognize this distinction, and not confound the unknowable with the knowable, but to confine attention to the latter alone. I cannot, however, in justice to myself and others, permit the imputation of the denial of a Supreme Being and of a future existence, to pass unnoticed, as it is a gratuitous and unfounded assumption. The theory of the origin of species by variation or evolution does not imply the denial of a Creator; on the contrary, it attributes everything to the operation of immutable and un-

changeable laws, nothing to the work of chance. The testimony presented by the rocks affords substantial evidence that there has been a gradual and progressive evolution or development from the lower to the higher forms of life. Thus, in the Silurian, the lowest of the Palæozoic rocks, the remains of invertebrates alone are found; following these, vertebrates (fishes) first appear in the Divonian; then come, in varying intervals of time, reptiles, birds, mammals, and, last of all, man.

The contemplation of such a humble origin in the past naturally leads to the anticipation of a still higher and nobler development in the future. Is there anything humiliating in the recognition of the fact that the life of man is dependent upon the continued destruction and consumption of plants and animals which enter into and become part and parcel of his organism? It has been estimated that a man, weighing one hundred and fifty pounds, in the course of a year, consumes a ton and a half of inorganic and organic matter,—in the air he breathes, the water he drinks, and the vegetables and animals he feeds upon,—and yet, at the end of the year, he weighs the same. What has become of all this matter which, like a continuous stream, has flowed through him, and maintained his form, apparently unchanged? It has returned to the source from whence it came, to be again used through all time. The inorganic matter of to-day may become organic matter to-morrow, to be again reduced, perchance, to inorganic matter on the following day. Man dies daily, and lives by dying. If the matter upon which his entire system depends is thus daily returned to nature, it naturally follows that in the final dissolution of the body, its component parts must be resolved into the elements, to enter into new combinations.

To those who cannot deny these truths, but may cry out "Materialism!" in response to such statements, I would say that I never hear that sublime epistle of Paul to the Corinthians, which is used on the most solemn occasions, connected with the dissolution of earthly ties, without being impressed with the learning and far-reaching philosophy of the great apostle, who there teaches what many of his professed followers are so slow to learn, concerning the resurrection, that it is not the natural

body, which is corruptible, but a spiritual and incorruptible body which is raised: "So also is the resurrection of the dead. It is sown in corruption; it is raised in incorruption." "It is sown a natural body; it is raised a spiritual body."

Dr. Atkinson said: It is well enough to define species, but it has not yet been done; when that has been attended to, it will be time enough to define the origin of species. Chemistry is the lowest manifestation of organic force, and the expression of the physiology and pathology of the mineral kingdom. Atheism is insanity; under the Divine government it is not possible that a being possessed of human intelligence can be an atheist. Nothing can be appropriated without being disrupted from its former position. The whole idea of assimilation is indicative of the destructive and constructive processes, without which the system cannot be sustained. Each form must be destroyed as to its identity before it can be appropriated, and each process has a chemical, mechanical and dynamic aspect, without a knowledge of which its understanding is incomplete, and the process of nutrition an enigma to us.

OPERATIVE DENTISTRY.

Dr. Corydon Palmer presented diagrams designed to illustrate the superior and inferior dental arches, in four divisions. By these, the peculiarities of each tooth were made apparent, and scientifically designated, as follows:

Left Superior Division, beginning at the mesian line:

Central Incisor, lingual surface, cutting edge,—anterior ridge, anterior depression, central ridge, posterior depression, posterior ridge, lingual fissure.

Lateral Incisor, the same in type as the central incisor, varying only in size, being smaller.

Cuspid, labial cusp, lingual depressed cusp.

First Bicuspid, anterior ridge, labial cusp, lingual cusp, anterior fissure, anterior transverse fissure, antero-posterior fissure,

posterior transverse fissure, posterior fissure, anterior pit, posterior pit, posterior ridge.

Second Bicuspid, the same in type, varying only in size, being larger.

First Molar, anterior ridge, anterior buccal cusp, posterior buccal cusp, anterior depressed palatal cusp, anterior palatal cusp, posterior palatal cusp, great transverse ridge, posterior ridge, anterior fissure, anterior transverse fissure, antero-longitudinal fissure, labial transverse fissure, palatal round fissure, palatal great curved fissure, posterior transverse fissure, posterior fissure, anterior pit, central pit, palatal pit, posterior palatal central pit, posterior buccal central pit.

Second Molar, differing only in size, being larger; the palatal curved fissure situated more posteriorly.

Third Molar, anterior ridge, anterior buccal cusp, posterior buccal cusp, palatal cusp, posterior ridge, anterior fissure, anterior transverse fissure, antero-longitudinal fissure, buccal transverse fissure, posterior longitudinal fissure, posterior transverse fissure, posterior fissure.

Right Superior Division, corresponds in all particulars with the left.

Left Inferior Division, mesian line:

Central Incisor, cutting edge, lingual surface, anterior ridge, anterior depression, central ridge, posterior depression, posterior ridge.

Lateral Incisor, differs only in size, being larger.

Cuspid, labial cusp, lingual depressed cusp.

First Bicuspid, anterior ridge, labial cusp, lingual depressed cusp, posterior ridge, anterior fissure, transverse fissure, antero-posterior fissure, posterior transverse fissure, posterior fissure.

Second Bicuspid, larger in size, lingual cusp undepressed.

First Molar, anterior ridge, anterior buccal cusp, posterior buccal cusp, central buccal cusp, anterior palatal cusp, posterior palatal cusp, posterior ridge, anterior fissure, anterior transverse fissure, antero-longitudinal fissure, palatal transverse fissure, posterior longitudinal fissure, posterior transverse fissure, pos-

terior fissure, anterior buccal transverse fissure, posterior buccal transverse fissure, anterior buccal round fissure, posterior buccal round fissure, anterior pit, anterior central pit, central pit, posterior central pit, posterior pit, anterior buccal pit, posterior buccal pit.

Second Molar, anterior ridge, anterior buccal cusp, posterior buccal cusp, anterior palatal cusp, posterior palatal cusp, posterior ridge, anterior fissure, anterior transverse fissure, anterior longitudinal fissure, buccal transverse fissure, palatal transverse fissure, posterior longitudinal fissure, posterior transverse fissure, posterior fissure, anterior pit, central pit, posterior pit, buccal round pit.

Third Molar, differs only in size from the second molar, being smaller.

Right Inferior Division, corresponds in all particulars with the left.

The diagrams were followed by enlarged models, representing—

1. Normal condition of well regulated teeth.
2. Indications for filling teeth.
3. Showing injurious modes of separating teeth and shaping cavities.
4. Proper manner of separating teeth by wedges.
5. Proper method of shaping cavities after wedging.

These were accompanied by three plaster casts, from impressions from the mouth, viz. :

No. 1. Case in practice. In this mouth, five large cavities in the molars were found imperfectly filled; while the decayed fissures and pits, and five small approximal cavities in the superior incisors, were left untouched.

No. 2. The same case. Cavities prepared for filling, in all the molars, and in all the bicuspids except the first inferior, and in the superior incisors. The incisors having been separated by wedging, the cavities were approached by cutting from the labial or lingual surface. The bicuspids were opened from the anterior to the posterior fissure, in some instances removing the

posterior ridge and cutting perpendicularly to the posterior cervical wall, forming a dovetail-shaped cavity. The molars were opened in such a manner as to thoroughly follow out all the fissures, the main cavity sometimes extending from the anterior to the posterior approximal surfaces, cutting through the anterior and posterior ridges; a principal feature, showing the buccal and palatal fissures cut through, so as to connect with the buccal and palatal round fissures.

No. 3. The same, as filled. Showing the perfect restoration of the lost portions of the teeth; the cusps and fissures being represented in size and form. The fillings being continuous from the anterior approximal to the posterior approximal walls, following out the line of the palatal and buccal transverse fissures in the molars; those in the bicuspids being also continuous antero-posteriorly, in accordance with the cavities as previously described.

No. 3. *Large Model.* Showing injurious modes of separating teeth and shaping cavities, representing V shaped cuts between the molars and bicuspids, by which the approximal cavities were reached, leaving the anterior and posterior fissures intact. The lateral cavities in the incisors were reached by perpendicular file cuts, leaving a shoulder at the neck of each tooth.

No. 4. *Large Model* (with wedges in position.) *Description of wedges.* First—Opening wedge; to be driven perpendicularly, or longitudinally, near the cutting edges, or grinding surfaces. Second—Protecting wedge, cut thin, and curved upon the edges, to fit the contour of the necks of the teeth, for protecting the gum from the retaining wedge; to be inserted with gentle force, and then cut off short. Third—Retaining wedge, to be inserted next to the protecting wedge. Wedges of four to five inches in length are most convenient, made from firm grained pieces of locust wood, which does not readily absorb moisture, and is not liable to slip.

Manner of using wedges. First, drive upon the opening wedge, next upon No. 3, the retaining wedge, which is designed only to hold what is gained by using No. 1. The wedges being driven, and sufficient space obtained, cut off the

retaining wedge even with the protecting wedge; next, insert a wedge, cut to the right length, on the inside, forced slightly, for keeping away the gum and excluding moisture. If the wedges rise above the cervical wall, they may be forced beyond it by driving upon them perpendicularly, thus: hold the wedge firmly with the forceps, at the same time forcing an instrument against it, which the assistant strikes with the mallet. This is preferable to cutting away the wedge with a sharp bur or other instrument, as no wedge can be effectual where a portion is cut away to get at the cavity.

There can be no objection to this method of separating the teeth, it being equally practicable for the child or the adult; if properly conducted no evil can result. The wedging should not be too rapid; a few minutes should be allowed for the teeth to separate; two or three wedges may be driven between two teeth, and the space thus gained secured by the one nearest the gum; the opening wedges being driven near the cutting edges of the teeth, will be more effectual and less painful. In a difficult case, half an hour may be employed in driving wedges and cutting them, in the interim working on some other tooth, then returning to the first, and changing the wedges, and so on, till the desired space is attained. Those opposed to the use of these wedges will be surprised to find how easily the teeth are moved, by giving to the operation a little time.

In reply to the question, how he would fill the left superior second bicuspid, as prepared in enlarged model, No. 5—(the cavity commencing at the anterior fissure, removing with it the anterior transverse fissure, following the antero-posterior fissure, connecting with the posterior transverse fissure, removing the posterior ridge to the cervical wall, forming posteriorly a dovetailed cavity, cut perpendicularly from the grinding surface, its greatest width being in the posterior portion of the body of the labial and lingual cusps, great care being taken to round the terminal angle in the cusps, to guard against fracture while filling,) —he stated that in this case he would proceed in the mode proposed by Dr. C. R. Butler, which consists in forming a mat of a third, a half, or a whole sheet of gold, as the case may indicate, (by folding it first lengthwise upon itself, afterward

crosswise) of sufficient size to cover the base of the cavity, and project beyond the cervical wall sufficiently to admit of thorough condensation at that most important position. Introduce the mat by carrying it to the angle of each perpendicular wall, allowing it to project over the cervical wall, holding it in place with an instrument at one point until another is secured, so continuing, until the whole is made firm by condensing with a foot instrument. Thence proceed to build up the posterior wall, keeping that in advance of the other portions, not omitting to condense laterally, from the very first, the circumferent gold being thus always a little in advance of the center. Finish, by restoring the posterior ridge and transverse fissure, proceeding forward through the antero-posterior fissure, widening out into the anterior transverse fissure, and finishing at the anterior fissure; so that the natural form of the ridges and fissures shall be reproduced.

Dr. Palmer advocated the filling of all cavities in teeth, however small, by means of the mallet, making this the exclusive practice. The smallest incisor approximal cavities can be more satisfactorily filled by the mallet than by hand force. In order to do it, everything must be adapted to this system,—instruments, adhesive foil, of one suitable number, to be annealed piece by piece, as used, throughout the whole operation, and no admixture of any different form of gold to be admitted. In starting a filling in one of the incisors, large or small, commence with one or two retaining pits, as the case may demand. These pits should be formed by a round drill, beveled from each side, followed by a fine, elastic, thin-pointed scoop, for clearing the cavity. The gold foil is prepared by cutting it into suitable strips and rolling upon a napkin, to avoid touching it with the hands. It is then cut into suitable lengths, and heated in the flame of a spirit lamp, before it is carried to the cavity, into which it is introduced with an instrument of smaller size, leaving a portion of the gold uncondensed to receive the next piece to be added. The retaining point being filled, proceed with a foot instrument and small curved instrument till even with the external walls of the cavity.

Dr. Palmer urged the importance of the thorough filling thus

described, as in all cases the proper rule, anything coming short of it being imperfect. He contrasted the thorough method with the old plan of filling isolated round cavities here and there, which left the fissures as channels for moisture to leak in and undermine the fillings. He claimed no originality in these methods, but professed to follow the course indicated by Dr. W. H. Atkinson.

The whole of the operations above named were fully represented in the models, large and small, which were freely examined by the audience, and were universally commended for their delicacy of detail and perfect truthfulness to nature.

Dr. Jesse Perkins at this point presented a case of loss of the inferior maxilla from phosphor-necrosis, with consequent retraction of the soft parts. Drs. Atkinson and Taft were requested to examine the case. They reported that the whole of the lower jaw was lost, and that an artificial appliance could only be made available by very gradual steps.

Dr. Allport gave some particulars of a surgical operation, where the bone forming the chin being removed, and the cut extremities approximating, he distended the parts gradually to their normal position by mechanical appliances, and then introduced a permanent artificial substitute.

Dr. Atkinson said: It is happy for the dental surgeon that the territory with which he has to do is so capable of being interfered with; and the rule to be observed, wherever imperfection exists, is to cut down with chisel and file to a healthy basis, saturate with creasote, and restore the exact contour of the lost or undeveloped parts. In ninety-nine per cent. of children's six-year molars there will be work to do. When a patient is presented, the first requirement is a correct diagnosis and a clear statement of the case, which should be given without regard to the chances of losing the operation. An imperfect diagnosis insures imperfect work. Cleaning the teeth is a matter of the first importance; if they are well developed and sound, see that the ligaments around them are all right, and carefully remove every particle of foreign matter deposited upon the necks and roots.

Question. When would you extract a tooth?

Dr. Atkinson. When I would bury a man—when he is dead. The tooth is not dead when the pulp is dead, nor when it is extirpated; for the cement continues to receive pabulum through the periosteum until the connection is entirely separated. This indicates the position we should assume. It is a wonder that the people have not anathematized the dental profession for all they have suffered from it; and but for hope of better things, which is always springing up in the human breast, we should all have been given over to nitrous oxide and the forceps. After finding the mischief, the next thing is to overcome it; and to do this use No. 20 foil, and a lead mallet of six to eight ounces; with these the work can be done easily.

Question. Can you save every case where the pulp is dead, or where there is a discharge from the socket of the tooth?

Dr. Atkinson. Yes, within my limits. A man is not dead until he is resolved back into his ultimates. Wherever there is a discharge, be sure there is life, which is trying to get rid of the diseased condition. The discharge of matter from the gums is due chiefly to the mode of brushing them, *from* the teeth, which spoils their attachment. In such a case remove all foreign matter from the root, be it more or less, and inject carefully, with a hypodermic syringe, a drop or two of the solution of the chloride of zinc, of the strength of 480 grains to the ounce of water, sufficient only to bathe all the parts where it is desirable to obtain an attachment; thus a coagulated substance from the juices of the flesh is obtained, and the attachment will in time be secured. Failure, after such treatment, may be set down as the result of an imperfect performance.

Dr. Wetherbee. Is an extracted tooth dead?

Dr. Atkinson. The pulp is dead very soon, but the dentine, from its analogy to the vegetable kingdom, requires a longer period, while the enamel is only killed by chemical solution.

Dr. Wetherbee. Should not those who extract teeth, then, be indicted?

Dr. Atkinson. "Let him who is without sin cast the first stone."

Dr. Wetherbee. We want to cease the use of the term "fang;" it is used by medical writers, but they are no authority for us. When a tooth has lost its attachments, is it alive?

Dr. Atkinson. So far as it is attached.

Dr. Wetherbee. Then, when it is nine-tenths detached, is it nine-tenths dead?

Dr. Atkinson. No.

Dr. Wetherbee proceeded to say that when the soft solids are devitalized, and the attachments lost, the tooth is dead. Total calcification is death. He objected to Dr. Palmer's preparation of cavities in the first superior molars; he considered the transverse ridge a weak point, which should be cut away; he also objected to there being two cavities made in the posterior part of the tooth—durability should be the only consideration. In the bicuspids, where there were two depressions and a fissure, he would cut from the posterior cavity forward to the anterior fissure.

Dr. Palmer explained that the cavities were prepared both ways, according to the indications.

Dr. Crouse said, that after treating alveolar abscess he thinks it best to use a temporary filling instead of inserting gold at once. Quick wedging is unnecessarily painful; wedges of soft pine, used gradually, are much more desirable; by taking a little longer time, teeth may be separated in this way with little or no soreness, thus avoiding the evil results which frequently follow the quick process. A member present had had his central incisors permanently separated by quick wedging. In filling bicuspids, he would prefer to have the teeth so prepared and filled as to preserve a space between them; the contrary practice, of filling in such a manner as to allow the teeth, or the filling, to come in contact after the removal of the wedges, insures fresh decay, unless more than ordinary care is exercised in keeping them clean. As to the models presented by Dr. Palmer, there is great objection to be taken to the angles which he makes in his method of excavating; they are much more difficult to be filled, and less secure when filled, than if the projections into the main cavity were cut away. Then in regard to gold foil; it is not best to try to confine any

one to one kind of foil, any more than to one kind of instrument; especially such high numbers as had been mentioned, as Nos. 14, 15 or 20. Nos. 2, 3 or 4 would be preferable. Non-adhesive as well as adhesive gold should be used; the soft foil mainly in cavities in which it can be readily retained, as well as over the edges of enamel, where it is more reliable and capable of perfect adaptation. Adhesive foil is indispensable in building up lost parts; but it should not be too adhesive, as that increases the difficulty of condensing. In retaining points for starting a filling, a piece of gold partially annealed may be used to advantage. Either the mallet or hand pressure may be used, according to the requirements of the case or the preferences of the operator.

Dr. Wetherbee said: Wedges are safe in skillful hands; they may be severe, but not half so severe as the use of rubber; the soreness caused by the rubber is a ten times greater objection to its use than that by the wedge. All the separation necessary, even in the smallest cavities between the front teeth, is such as to allow the passage of the thinnest file; with properly formed instruments, any more room may be obtained, if needed, from the palatal surface. Comparing the practice of twenty years ago with that of to-day, he was sure that there is less suffering from the quick wedge than from the rubber.

Dr. Thomas said: I am opposed to the method of what is known as "quick wedging," for three reasons: First, because of the great danger of injuring the periosteum to such an extent that periostitis is almost sure to follow; second, because of the unnecessary suffering of the patient; and third, because by the employment of other means more satisfactory results are secured.

The primary object in driving the wedge, is to secure space for the purpose of operating upon the approximal surfaces of the teeth. This being the case, the material employed must be of the very best quality, hard, close grained, well seasoned wood—so quick wedgers tell us—and could a sufficient amount of friction be obtained to prevent the wedge from slipping, I have no doubt but some enthusiastic operator of this class would at once fill the market with steel wedges. Although the periosteum

that surrounds the teeth is a highly porous, osseous structure, and will bear a great amount of ill treatment, yet it must be done mildly, and not roughly. The process of quick wedging is certainly anything but a gentle one, and there are none present who have had any experience in the treatment of periostitis—and there are few who have not, especially among quick wedgers—but will certainly agree with me in this, that we should at all times avoid all means that will induce this state of things. And do we not know that the injury which the periosteum often sustains in this immediate forcing of the teeth upon it, does induce, if not actually produce, periostitis? I have seen it in not a few cases, as I have no doubt many a one before me has.

The question has often been asked me by those advocating quick wedging, why it is, if simply starting the process by the use of the wedge causes periostitis, we do not endanger our patients every time we extract so many teeth, as we are often called upon to do preparatory to an artificial denture. The reason is obvious. In wedging, the periosteum suffers just enough to excite inflammation, and upon the removal of the wedge the teeth are in a loosened condition, and act as foreign substances upon the periosteum when performing the office of mastication, so much so that the inflammation is continually aggravated; while, on the other hand, there is nothing left to aggravate the injury to the periosteum, and the process of healing at once commences.

Who has not been entreated again and again, not only by words, but by groans, and tears, even (which speak distress as nothing else can), to desist from an operation so painful? It is a suffering which none but those who have had personal experience in can testify of. I have suffered more from this mode of treatment than I can well express here, and more than I ever shall submit to again, even though it be—as it was then— at the hands of otherwise good operators, especially while I believe it unnecessary. I freely admit that there are exceptional cases, where quick wedging seems the only alternative. The patient lives at a distance, and thinks to come to town more than once for the saving of a tooth is time lost *in toto*. Such persons would perhaps rather suffer the pain than come again, and

hence quick wedging must be resorted to, unless (which I think the better plan) you cut away a portion of the enamel from the lingual or palatine surface to secure space instead of wedging; this method I think will prove as satisfactory to you, and certainly so to your patient.

Experience has taught me that cotton (in my hands at least) is the most efficient and least troublesome of all the materials used for separating purposes. Introducing between the teeth to be operated upon, as much to-day as can be easily forced in, repeating to-morrow with double the amount, and the third day you can usually operate with perfect ease, by employing either the rubber or string dam, or a wedge lightly driven, simply to hold the tooth firm in position, and prevent the mucus interfering with your operation; and this space has been secured, too, without your patient even so much as knowing it—from any discomfort, at least—for they are often surprised at the space between the teeth, and even skeptical as to their taking their former position; while in quick wedging the patient exclaims against such torture and cruelty, for I am sorry to say some of my brother dentists seem to lose all feeling for their patients, and are unmindful of their suffering to a wondrous degree.

Another decided advantage that cotton has over the wedge, is, that it frees the cavity of gum that so often impinges largely upon it; and that, too, without lacerating the gum as the wedge must necessarily do. I have sometimes used rubber instead of cotton, but this was usually too severe, the same trouble following as from the wedge, its expansive powers are too great; the expansion of the fibres of cotton are sufficient in all cases.

A case in point, and I am done. At the yearly meeting of the Michigan State Dental Association in the fall of 1868, I was called upon during the hour for clinics, to fill the posterior approximal surface of the right superior central incisor, for one of the members present. Upon examination I at once saw a good opportunity for the demonstration of quick wedging, and as discussions had just closed upon that subject, I called the attention of a very worthy advocate to the matter, and requested that he should do the wedging and I would do the filling: to

which he consented very willingly. I may here state that the lateral adjoining contained a large but good plug, and was withal rather a weak tooth. All things being in readiness, down came the sledge and in went the wedge, and as our patient happened to be a man of extreme meekness, not a murmur escaped him, although many a tear was shed, which but too plainly told of the miseries of quick wedging. Nor was this all, for before the thing was pronounced a success, he was minus the half of the lateral incisor, the place of which had to be supplied with an equal amount of gold, which is quite unsightly when compared with good tooth substance.

Dr. Woolworth rose to say that he agreed fully with the views of the last speaker.

Dr. McDonnell announced himself as a champion of quick wedging; he had never split the alveolus nor done any other damage; but admitting such things to have happened, they were no more an argument against quick wedging than similar occurrences in extracting; all his experience was opposed to slow wedging. He considered contour fillings indispensable, and covered all exposed dentine and parts of enamel that had been cut, with gold. He did not like the file for cutting out fissures, and only used it for cutting away frail enamel.

Dr. Morgan said: I assume the enamel to be a living tissue, and as a portion of it is composed of animal matter, it must be subject to wear and replacement in common with other osseous tissues. That this is so appears from the fact that enamel deprived of its subjacent dentine ultimately breaks down from lack of nutrition, though this result may be very slow of attainment. It is very necessary to pay proper attention to children's temporary teeth; in the sixth-year molars, in adults, I find about one in forty that needs no operations. Cleansing teeth is another matter that cannot be too carefully attended to; I think I have never thoroughly cleansed a bad set of teeth in my life, and I have never seen it done by any one else. I would add my testimony that the vitality of a tooth is never lost as long as there is any adhesion of the periosteum; when entirely dead, nature throws it off. I cannot agree with a former speaker that the transverse ridge should always be

cut out; there are cases where this should be done, but it is by no means the rule; on the contrary, the rule should be to cut as far as the open fissure in the enamel reaches, but not a hair's breadth further. It is desirable to retain as much of the solid substance of the tooth as possible; but if a part is burrowed under, or there is doubt of its strength, it should be cut away. It has been assumed that in bicuspids all the fissures should be cut out; this may be necessary in many cases, but I think it wrong where the cusps are short and the enamel strong. I protest against the idea that gold is better than sound tooth substance. The proposition to cut away the sides of the cusps to correspond with the size of the neck, would ruin the teeth in many cases. I do not think it practicable to cover the edge of enamel at the cervical wall of the tooth, if beveled; there might be sufficient leakage between the enamel and dentine to destroy both.

Dr. Palmer said that a retaining pit was, of all others, the place where adhesive foil should be used; he did not round the corners of the enamel; he wanted them as square as he could get them.

Dr. Wetherbee opposed beveling; he removes the feather edge of the enamel with a watchmaker's file. He objected to preparing cavities by simply following out all the fissures. In preparing cavities the vulnerable portions of the enamel should be cut away until a sound healthy margin is obtained. The admissibility of so many *angles* in the preparation of cavities as are represented in the elegant models on exhibition by Dr. C. Palmer is *very doubtful*, to say the least, and should always be discarded. He would rather cut off the angles, throwing the cavity into one; moreover, nothing is gained by leaving transverse ridges; the tooth is stronger without than with them. The operation should always be done in the best manner, irrespective of other considerations.

Dr. Crouse agreed with Dr. Wetherbee as to the manner of opening cavities, but not on wedging; quick wedging is a heroic kind of practice, and dangerous. He also required more space between teeth than the previous speaker had indicated; he did not think any one could make a perfect filling with so

little separation. He denied cutting away the bicuspids in the manner charged; he would cut sufficiently to preserve a proper space between the teeth to keep them clean. Filling fine retaining points is about the most difficult part of an operation. He maintained his views in regard to soft foil, and predicted a greater use of it than ever.

Dr. Mills pursues quick wedging as a means of saving his patients from more painful operations. He removes the feather edge from enamel by using a fine file. Cleaning teeth is a subject of the greatest importance, and one to which he had devoted his best efforts; very few, he was persuaded, had any adequate idea of what is meant by the expression; it is not merely to take away the portions of tartar that may be conveniently reached, but to remove every particle of foreign substance on any part of the tooth.

Dr. McQuillen said: My experience as a teacher has convinced me that students can be taught in a few months to fill a tooth in a highly creditable and skillful manner. It is not enough, however, to know How to do! but What to do! and When to do! This implies a thorough knowledge of the cause of trouble; and it demands a devotion of years to acquire that thorough knowledge of the principles and practice of the profession, combined with the constant and daily application of them, which can enable a practitioner to diagnose promptly and correctly the varied and complicated cases occurring in practice, or upon which the medical man may desire an opinion in consultation. Even with the most careful training, few manifest this faculty in a high degree; apparently only those who have been endowed by nature with peculiar gifts, like the divine afflatus of the poet. What is it, in the justly eminent physician, surgeon, or dentist, which secures the confidence and respect alike of the community and the profession? Is it the fertility and inexhaustible resources manifested by the physician in his prescriptions, or the facility with which the surgeon amputates a limb or extirpates a tumor, or the dexterity and skill displayed by the dentist in the performance of his operations? These qualities are frequently manifested by men who make but a slight impression on the world; but when they are combined with the

possession of diagnostic powers of a high order, a master mind is recognized and respected as such. While few can occupy such an elevated field of usefulness, all should endeavor to develop to the fullest extent the perceptive and reasoning faculties which have been granted to them, for it is through the constant exercise of these that the ability to diagnose correctly depends.

[In applying these principles to the practice of dentistry, reference was made to the necessity of employing the finest probes (possessing flexibility and toughness) in the examination of the teeth, so as to discover those minute openings in the enamel which frequently lead into cavities of the largest size. The prevalence of symmetrical disease in the teeth, and the more than probable supposition that when a tooth was found decayed on one side the corresponding one of the opposite side would prove to be in the same condition, was dwelt upon as a matter of decided moment to bear in remembrance.]

Dr. Butler spoke of the care necessary in examining cases; it can only be properly done with fine probes, and silk thread, and wedges. It is proper and necessary that a fee should be charged for such examinations, as physicians do. As remarked by a previous speaker, it is impossible that the result of a defective diagnosis can be otherwise than unsatisfactory.

DENTAL HISTOLOGY.

Dr. McQuillen said, that, as Chairman of the Committee on Dental Histology, he had no written report to offer, but in place of one would make a verbal statement of some of the work which had recently engaged his attention—the injection of the pulps of calves' teeth, a number of preparations of which he had brought with him and would exhibit to the members under the microscope. The subject was one which he had been compelled to work out for himself, as he could not find any account, in the works which he had access to, of the method to be pursued, except such as applied to other organs—the liver, kidneys,

etc. Having made an injection of a kidney, and mounted microscopical sections of it, which had been well thought of by several professional friends, he concluded to try a new field, in which, after a number of unsuccessful efforts, he had obtained the results which would be shown, as follows: procuring a calf's head at the market house, the external carotid artery (which gives off a branch, the internal maxillary, supplying the teeth with blood-vessels) was sought for and found, after some trouble, owing to the contraction and retraction of the muscular coat of the artery, burying it in the surrounding soft parts; the detached nozzle of the injecting pipe was then introduced into the mouth of the artery and securely tied around it, and the calf's head placed in a pan of warm water, not so full as to cover the nozzle of the syringe, and just hot enough to bear the hand of the operator without discomfort. In the meantime a bottle containing Dr. Carter's carmine injecting fluid had been placed in water of the same temperature, and the syringe treated in the same manner. After the head had been in the water about ten minutes the syringe was filled with the coloring fluid, and the latter slowly and gradually injected into the vessels; great care being exercised not to allow any air to be in the nozzle of the syringe, as this would be forced into the vessels, and prevent the injection. On completing the injection, the head was removed from the water and set away in a cool place for an hour or so, when the incisors and some of the molars were extracted with ordinary forceps, and the teeth split open so as to expose the pulps. The latter were only found adherent to the walls of the pulp cavity at the extremity of the roots, where the process of growth was progressing most rapidly. At this point the adhesion was so firm as to require considerable force to sever the connection. The pulps were then placed in a preservative fluid, composed of Bower's glycerin, one ounce, strong acetic acid, five drops, and allowed to remain in it for a few days, when they were mounted in glycerin jelly on glass slides, the thin glass cover being secured by a ring of white cement around the edges. The results obtained would be seen under the microscope to present a rich plexus of minute vessels branching off from a number of larger ones, and these

again being derived from the main artery of the pulp. In addition to this, projecting from the sides of the pulp, would be observed the dentinal fibrils of Tomes.

In bringing this subject before the Association, the speaker said it was merely introductory to a series of investigations which he proposed to enter upon, in relation to the histology of the dental pulp in the three stages of dentition,—follicular, saccular, and eruptive. The observations of Goodsir were of incalculable value in this direction, but it should be remembered that his work was accomplished without the aid of the microscope, and the employment of that instrument would no doubt reveal some new facts in this interesting field; and although something had been done by European microscopists, there yet remained ample room and verge enough for others.

Attention was directed to the obligations resting upon dental practitioners to do their part in contributing to science, and thus relieve the profession in America from the well-founded charge of being dependent upon European investigators for their knowledge of dental histology. The advantages and opportunities enjoyed by European investigators were contrasted with the difficulties surrounding such efforts in America; yet it was contended that there was no reason why rich results should not be obtained here, by those who would devote themselves untiringly to scientific investigations. The only way to gain knowledge, in new and unexplored fields, was to keep trying; even though blundering ever and anon. Persistence in such efforts frequently yielded results gratifying to the investigator, surprising to the world, and constituting a valuable addition to the annals of science.

In addition to the specimens of pulps, he exhibited some sections of an injected sheep's kidney, showing the Malpighian corpuscles; also a number of preparations made within the last six months illustrative of that terrible disease, trichina, which was either more generally recognized or fearfully on the increase in America. The former supposition was the most probable, and many cases of death, with the cause shrouded in obscurity, had been doubtless due to the presence of these horrible parasites. The specimens were: No. 1, A woman who died in

the Philadelphia Hospital last winter; showing the trichina inclosed in cysts. No. 2, A young girl who died in Clay City, Illinois, with the trichina very numerous, unencysted, and in migratory condition. No. 3, A woman who died in Elgin, Ill.. with the trichina very numerous and coiled up, apparently preparatory to becoming encysted. Judging from the presence of large quantities of oil globules, the muscular tissue had apparently undergone fatty degeneration. No. 4, A portion of pork containing trichina eaten by the person from whom the preceding specimen had been taken. The trichina, although not very abundant in the pork, were well marked. As a series of specimens, these preparations were very valuable, particularly for educational purposes, in showing the parasite in various conditions, and in the fact that the last two specimens bore the relation of cause and effect, in the development of the disease of which the person died.

Dr. Atkinson said: The European scientists are so near to one another that they have to confine themselves to a single tissue in order to avoid collisions; and they spend a whole lifetime in following up one train of investigation. It is the prevailing habit of Americans to spread their investigations over so large a field as to be necessarily superficial; and therefore foreign opinion could not be very complimentary to the Yankees. He was not distressed because they would not receive experiments by us as conclusive. He had been largely occupied of late with experiments in the development of the hen's egg into the chick, by which he had been fully convinced that the only difference between the white and the red corpuscle is in the coloring material, which is formed in the egg before either the corpuscles or the vessels. The young corpuscles are arranged in tracts, without walls; simple germinal matter, which the best powers of the microscope cannot reduce into individual bodies; mere flocculent masses originating on the border of the yelk. The blood corpuscles are seed bodies from which all tissues arise; the origin of any planetary body cannot be presented to the physical sense, but only to the intellect. In our present condition our minds are divided just as the molecules are when they become sick. Irritation is the first

disturbance of nutrient action; aberrant nutrient action may be spent or neutralized, or compromised and further sickened. White corpuscles are designed for the formation of white tissues, and are the embryos of the red corpuscles, whose mission is the formation of red tissues and the conveyance of oxygen to the various cell territories. He thanked God for the invention of the microscope; its revealments are the platform on which all operations on the human body should be based. Histogeny is the alphabet of all medical science, and without it there can be only bungling spelling.

Dr. Judd said, there was a great deal more of danger from trichina than was generally supposed. A professor in the St. Louis Medical College had examined, under the microscope, specimens from six subjects which lay side by side in the dissecting-room last winter, without any reference to the disease by which they had died, and of these six he found trichina in three. He believed many deaths occurred from trichina which were set down to other causes.

It is a common saying among histologists that, so far as the microscopic characteristics are concerned, no difference can be observed between the cell that is to be developed into an elephant or into an oak; and hence it has been and is still agreed that the final differences are determined by conditions external to the cell itself. But a few observations have been recently made by one Paul Reinsch, of Moscow, in Russia, and have been verified by others, which seem to throw a little light upon this dark subject. Observations made upon individual cells in living plants show that there are currents in the protoplasmic contents of the cells; that these currents or motions of the protoplasm differ in different genera and species, but that in each particular species and genus they are as definite and constant in their course as the Kuro-Sievo of the Pacific, or the Gulf Stream of the Atlantic waters. If future observations shall succeed in establishing this principle as true of all living cells, shall we not be able to determine the potentiality of the cell, and that too by the same characteristic which determines the different forces, or different phases of the same force, if there be but one, that is, by means of motion?

Dr. McQuillen said: The reproduction of organic beings is effected by one of two methods,—the *asexual* or the *sexual*. Illustrations of the first are presented in the "budding" of plants, and in the lower forms of animal life, as the polypus, for instance. These "buddings" becoming detached, constitute new beings. Sexual reproduction, on the other hand, implies male and female parents, the first furnishing the spermatozoa, and the last the ovum, or egg, among animals; while in the vegetable kingdom, the first supply the pollen-grain, or antherozoid, and the last the ovule or seed. The direct union of the spermatozoa and the ovum is indispensable to the development of a new being, neither of them alone having the power of assuming the form of the parent. When examined under the microscope, the ovum of one animal resembles so closely that of other animals that it is impossible to distinguish between them; yet that there is a specific tendency for each to grow in the resemblance of its parents, no one would pretend to deny; and in applying the term *Atavism* to this property, it conveys the same idea as *potentiality*, for it means the tendency of like to produce like. It should be remembered, however, that in addition to this, there is also a tendency to *variation*, by which the offspring, although resembling their parents in many particulars, yet differed with them in other respects; and that in some instances the difference is so great as to destroy all resemblance. This tendency to *variation* may not produce important modifications of form in all the living beings under the observation of man, in the limited period granted him to make his investigations, but in the lapse of ages, and with changing *conditions of existence*, it may be attended by alterations of the most important and wonderful character in the *progressive development of species*.

It is natural that the majority of those who have been taught to regard the origin of species as taking place by special creations, and who esteem it as an article of faith, should oppose such views, as it is but a repetition of the experience of the past in the progress of science. Men generally cling firmly and fondly to old and cherished opinions; and there is such a tendency to fossilization, on the part of the old and middle-aged,

that but for the efforts and support of independent thinkers, and the fact that the plastic minds of the young are ever ready to receive new truths, there would be no advancement in science, the arts, or in letters. Society, ever and anon, grows too large for its old clothes or ideas. The serpent, the lobster, the crab, indeed all animals, man not even excepted, are constantly throwing off the old integuments, some slowly and gradually, scale by scale, while others cast the skin or shell entire, when no longer serving a useful purpose. Martin Luther and his confrères, theological and scientific, succeeded in bursting through and casting a pretty large, thick, and tough skin at the Reformation; men of science are engaged upon one in the present age, quite as difficult to rend; and, as Prof. Huxley remarks, "every good citizen must feel bound to facilitate the process, and even if he have nothing but a scalpel, to work withal, to ease the cracking integument to the best of his ability;" or, as one might add, increase the gap with the investigations and revelations of the microscope.

It is a source of congratulation, as an evidence of growing liberality, that such subjects can be discussed without that manifestation of bitter opposition and feeling, and an indulgence in personalities, too often evoked. If those who favor the theory of the *progressive development of species* are in error, the best way to convince them of their mistake is by calm, dispassionate argument, and the presentation of incontrovertible evidence, rather than to denounce them for entertaining views which they may have erred in accepting, but yet honestly infer to be at least reasonable suppositions, if not fully proven.

AMENDED CONSTITUTION

OF THE

AMERICAN DENTAL ASSOCIATION.

ADOPTED AT SARATOGA, AUGUST, 1869.

ARTICLE I.

Name.—This organization shall be known by the name of the AMERICAN DENTAL ASSOCIATION.

ARTICLE II.

Objects.—The objects of this Association shall be, to cultivate the science and art of Dentistry, and all its collateral branches; to elevate and sustain the professional character of Dentists, to promote among them mutual improvement, social intercourse and good feeling, and collectively to represent and have cognizance of the common interests of the Dental Profession.

ARTICLE III.

SECTION 1. *Membership. Number of delegates from local Societies.*— Each local society may send one for every five of its active members, and each Dental College one from its faculty, as delegates to this Association, for one year, upon complying with the requirements of its Constitution, but no society shall be entitled to representation that does not adopt or substantially recognize its code of ethics.

SEC. 2. *Expelled members.*—Any member of this Association, being expelled from his local society, shall from that date cease to be a member of this body.

SEC. 3. *Members to be of two Classes.*—The members of this Association shall be of two classes, delegates and permanent members, having equal rights and privileges.

SEC. 4. *Delegates.*—All delegates shall be practitioners of Dentistry; they shall receive their appointment only from permanently organized Dental Societies and Dental Colleges, having definite conditions of membership other than pecuniary, which shall have been approved by the Executive Committee, and a copy of which shall be in the hands of the Recording Secretary of this body.

SEC. 5. *Permanent Members.* — Permanent members shall consist of those who, having served one year as delegates, and complied with the requirements of the Association, shall signify to the Treasurer a desire for permanent membership.

SEC. 6. *Signing Constitution.* — Each new member, before voting or speaking on any subject before the meeting, shall sign these regulations. inscribing his name, and the title and location of the institution from which he receives his appointment.

SEC. 7. *Dues.*—Five dollars shall be paid to the Treasurer by each member yearly, as dues, before he can be elegible to office, or speak or vote on any subject before the Association, and in case the dues remain unpaid at the close of the second annual meeting thereafter, the name of any such delinquent shall be erased from the list of members without further action.

SEC. 8. *Giving name on rising.*—No one shall be permitted to address the Association before giving his name and residence, which shall be distinctly announced from the chair, nor shall he speak more than twice, nor longer than fifteen minutes in all, unless by consent of the Association.

SEC. 9. *Conduct of Members.* — Any act of special immorality or unprofessional conduct, committed by a member of this Association, shall be referred to the Executive Committee, (second division), whose duty it shall be to thoroughly examine into the case, and report at the next meeting, if the charges be sustained. Whereupon, by a vote, the offending member may

be reprimanded or expelled, a two-thirds vote being required for expulsion, a majority being sufficient for reprimand.

ARTICLE IV.

Time of Meetings.—The regular meetings of the Association shall be held annually, and commence on the first Tuesday in August. The place of meeting shall be determined each year by vote of the Association.

ARTICLE V.

SECTION 1. *Officers. How elected.* — The officers of this Association shall be a President, two Vice-Presidents, Corresponding Secretary, Recording Secretary, Treasurer, and the Executive Committee, who shall be elected by ballot without nomination. The two names, or in case of a tie, the three names having the greatest number of votes, shall be the sole nominees in case of failure to elect on the first ballot, and a majority of all the votes cast for those names, shall be necessary to a choice.

Each officer, except as otherwise provided, shall hold his appointment for one year, or until another is elected to succeed him.

SEC. 2. *President, duties of.* — The President shall preside according to Parliamentary usage, as laid down in Cushing's Manual, and the rules of order adopted by this Association.

SEC. 3. *Vice-President.*—In the absence of the President, one of the Vice-Presidents shall perform the duties of the office, and in the absence of these officers, a chairman *pro tem.* shall be appointed by acclamation.

SEC. 4. *Corresponding Secretary.*—The Corresponding Secretary shall attend to the correspondence of the Association with the Societies therein represented, and to correspondence with other scientific bodies as may be desirable.

SEC. 5. *Recording Secretary.* — The Recording Secretary shall keep accurate minutes of the proceedings of the Association, preserve the archives and unpublished documents, and attend to the other duties that pertain to his office. He shall

be *ex officio* chairman of the Publication Committee, and shall see that due notice is given of the time and place of meeting of the Association.

SEC. 6. *Executive Committee.* — The Executive Committee shall be the business committee of the Association, and shall consist of nine members, to whom shall be referred all business not otherwise specially provided for. They shall report at each meeting, under the proper head, their doings for the current year.

Sub-Committees. 1*st Division, Committee of Arrangements.*— Three members of this committee shall act as the Committee of Arrangements, and shall procure suitable accommodations for the meetings and clinics, and for the exhibition and examination of appliances, of which they shall have the charge. These three shall, if practicable, reside at or near the place at which the Association is to hold its next annual meeting; and shall attend generally to the wants of the Association during its session.

2*nd Division. Credentials and Auditing Committee.*—Other three shall examine and verify the credentials and qualifications of members, including all violations of the code of ethics and the constitution, and shall also be the auditing committee for that year

3*rd Division. Committee on Nominations and Volunteer Essays.* — The remaining three shall examine all volunteer essays, and before they are read to the Association shall give their approval, in order that time may not be taken up by unworthy or irrelevant matter.

They shall report names for the Standing Committees for the ensuing year, and the names of places for the next meeting.

Publication Committee, how appointed.—Immediately after the election of new members to the Executive Committee, two from that committee shall be appointed by the President to act in conjunction with the Recording Secretary, as the Publication Committee. They shall be authorized to employ a competent reporter to furnish an accurate report of the proceedings of each meeting.

Instructions to the Publication Committee.—They shall superintend the publication and distribution of such portions of the Transactions as the Association may direct, or the committee judge to be of sufficient value. They shall specify in the annual report of this committee the character and cost of the publications of the Association during the year, and the number of copies still on hand.

Disclaimer.—This committee is hereby instructed to print at the beginning of each volume of the Transactions, the following disclaimer, viz.: "The American Dental Association, although formally accepting and publishing the reports of the various Standing Committees, and the essays read before the Association, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution."

Reports of sub-committees.—Each of these sub-committees shall report from time to time as may be necessary, to the Executive Committee as a whole, who shall decide upon such report if possible, but in case of their inability to decide upon any matter, it shall be brought before the Association for its decision as early as practicable.

Classification of Executive Committee.—At the first election of this committee, the first three shall be elected to serve three years, the second three for two years, and the last three for one year, and thenceforward three new members shall be elected each year by ballot, to serve three years, and in case of the absence of any member of this committee, his place may be temporarily filled by the remaining members of the committee.

Meetings of Executive Committee.—The Executive Committee shall, if possible, meet for consultation and arrangement of their respective duties, on the day preceding the annual meeting of the Association, and shall meet for the examination of credentials, the arrangement of appliances, and the reception of papers, and such other business as may properly come before them, at 8 A. M., on the day of the annual meeting.

Sub-division of Executive Committee.—They shall also meet after the election of new members to the committee, to choose

their own chairman and Secretary, and to divide themselves into sub-committees as hereinbefore provided, and for the purposes described.

Chairman may convene the Committee.—The chairman of this committee may, at his own discretion, summon the members thereof to a meeting, at any suitable hour during the sessions of the Association.

SEC. 7. *Treasurer to attend, to receive dues, at* 8 A. M.—The Treasurer shall hold all the moneys belonging to the Association, and shall keep an accurate account as between the society and its members. He shall attend the meeting of the Executive Committee at 8 A. M., on the day of the annual meeting, to receive dues, and shall attend at roll call to verify the list of names, checking all such as are in arrears for dues; he shall restore such names upon payment of dues within the legal limits, and shall notify all whose names may be erased from the list of membership. He shall pay the drafts of the President, countersigned by the Secretary, upon vote of the society only, and shall report to the Executive Committee where his accounts shall be audited, and by whom his report shall be presented to the Association, together with their own.

ARTICLE VI.

SECTION 1. *Names of Standing Committees.*—The following Standing Committees of three, shall be appointed at each annual meeting, to prepare, arrange, and expedite business in their several departments for the ensuing year, viz.:

A Committee on Physiology.
" Dental Pathology and Surgery.
" Dental Histology and Microscopy.
" Dental Chemistry.
" Dental Therapeutics.
" Operative Dentistry.
" Mechanical Dentistry.
" Dental Education.
" Dental Literature.
" Prize Essays.

SEC. 2. *Duties of Members of Committees.*—It shall be the duty of each member of the Standing Committees to make an individual report, so far as such report can be made, and in case of inability to be present at the meeting where that report is due, to forward it to the Recording Secretary, from whom it can be obtained by the chairman of each committee, respectively, at the time of assembling of this Association.

SEC. 3. *Duties of Committees.*—Each committee shall report, if practicable, the results of original investigations in their several departments, and also such new matter, collected from all the sources at their command, as may be of interest and profit to the Association.

SEC. 4. *Committees on Operative and Mechanical Dentistry.*—The Committees on Operative and Mechanical Dentistry shall thoroughly test, and report upon new modes and materials, and upon their physical properties, stating clearly *why* any particular mode of practice should claim attention, and giving tabulated lists of successes and failures so far as may be obtainable.

SEC. 5. *Prize Essays.*—Two prizes of medals, not exceeding in value fifty dollars each, may be awarded to the best two communications reported on favorably by the Committee on Prize Essays, directed by the Association to be published.

ARTICLE VII.

Quorum.—Fifteen members shall constitute a quorum for the transaction of business in this Association.

ARTICLE VIII.

Suspending Rules three-fourths to vote.—This order of business may be temporarily suspended by a three-fourths vote of all the members present, for the consideration of a specific subject, upon the completion of which the regular order shall be at once resumed.

ORDER OF BUSINESS.

1. Meeting of the Executive Committee, filling of vacancies therein, examination of credentials, and payment of dues. 8 A. M.

2. Organization of the meeting. 10 A. M.
3. Calling the roll of qualified members.
4. Reading of the minutes, and action thereon.
5. The reading and consideration of the stated annual reports from the Standing Committees, together with volunteer papers upon the same subjects, in their consecutive order.
6. Report of Executive Committee.
7. Balloting for the place of next annual meeting.
8. Election of Officers, and three members of the Executive Committee.
9. Appointment of Standing Committees.
10. Instructions to the Permanent Committees.
11. Unfinished, new, and miscellaneous business.
12. Adjournment.

ARTICLE IX.

Amendments.—No alteration or amendment shall be made in the foregoing articles, or rules of order, except with the consent of three-fourths of the members present at the subsequent annual meeting to that at which such amendment or alteration may have been proposed in writing.

RULES OF ORDER.

1. On the arrival of the hour of meeting the President shall take the chair, call to order, and announce that the meeting is open for business.

2. No motion or speech shall be in order until the mover or speaker shall have been recognized and assigned the floor by the chair, nor shall a motion be open for debate until seconded and stated by the chair.

3. At the request of any member a motion shall be put in writing.

4. At the request of five members a question shall be divided, or the yeas and nays ordered.

5. When a question is under debate no other motion shall be in order, except, 1st, to adjourn; 2nd, to lay on the table; 3rd, the previous question; 4th, to postpone; 5th, to commit; 6th, to amend; and these motions shall take precedence in the order here stated.

6. The previous question, and the motions to adjourn, to lay on the table, and to postpone, shall be decided without debate.

7. A motion to adjourn shall be always in order, but no member can make such a motion while another is speaking, or while a vote or ballot is being taken.

8. A second amendment to the main question shall not be in order until the first is disposed of, nor shall there be an amendment of an amendment to an amendment.

9. After a motion has been seconded and stated by the chair, it shall not be withdrawn without the consent of the Society.

10. No member shall interrupt another while speaking, except to call him to order.

11. When called to order a member shall sit down until the point of order is decided by the chair, or, in case of appeal, by the Society. If the point of order be sustained, the member can proceed in order by the consent of the Society.

12. Every member shall vote upon a question unless excused by the Society.

13. When any motion, except to adjourn, has been rejected, it shall not be renewed without unanimous consent.

14. Any member who voted in the majority may move a reconsideration of that question, but if that motion shall be lost, or laid upon the table, it shall not be renewed without unanimous consent.

15. The President may vote with the members upon all questions, but having so voted, shall not give the casting vote in case of a tie.

16. Motions for filling blanks shall be put in the order in which they are moved.

17. On a division, or in voting by yeas and nays, any member may change his vote before the result is declared.

18. These rules may be suspended by unanimous consent.

E. A. BOGUE,
W. H. GODDARD,
W. H. MORGAN,
Committee on Revision.

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